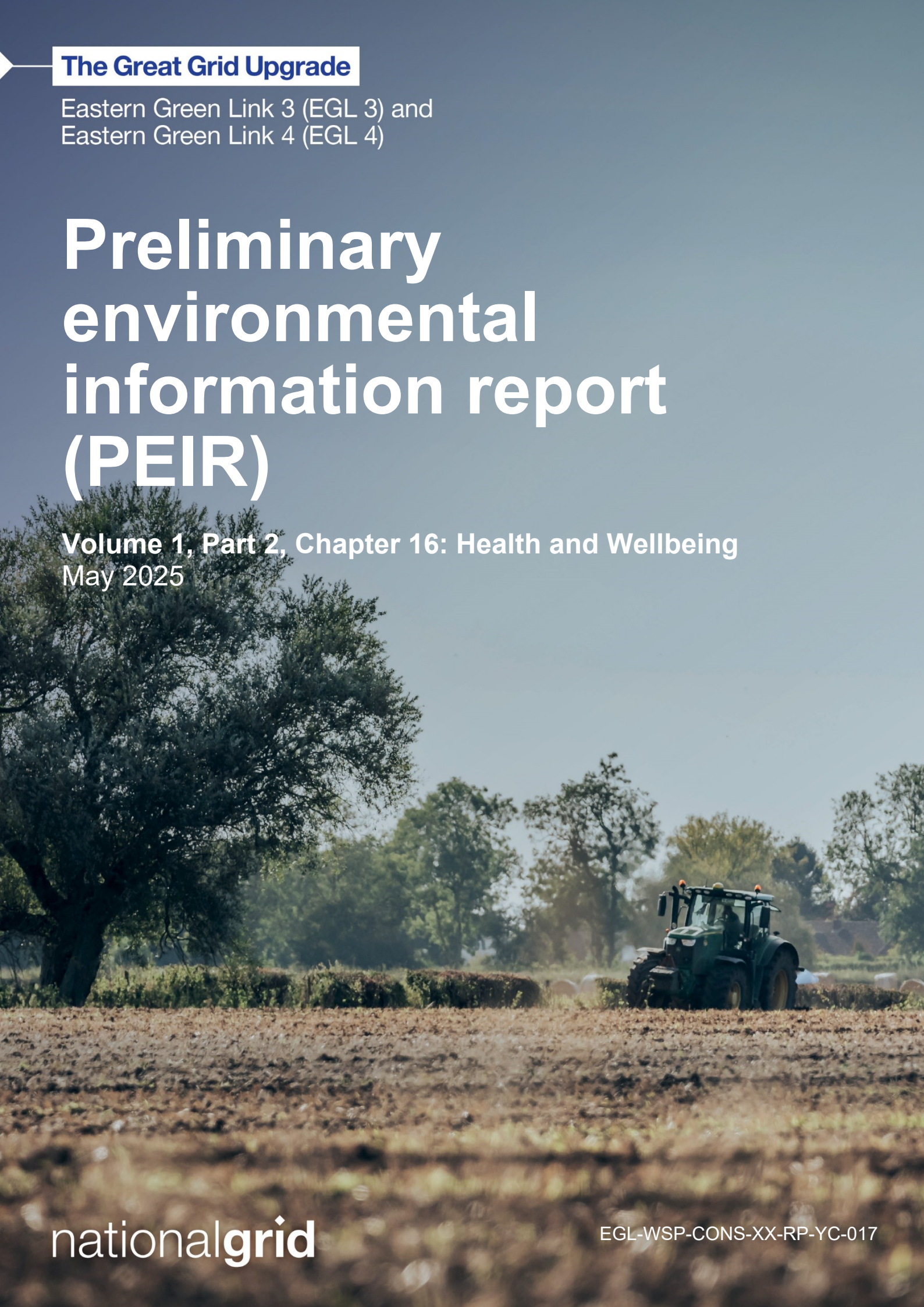
The Great Grid Upgrade

Eastern Green Link 3 (EGL 3) and
Eastern Green Link 4 (EGL 4)

Preliminary environmental information report (PEIR)

Volume 1, Part 2, Chapter 16: Health and Wellbeing

May 2025



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16. Health and Wellbeing

16.1 Introduction

16.1.1 This chapter presents the preliminary findings of the Environmental Impact Assessment (EIA) undertaken to date for the Eastern Green Link 3 (EGL 3) and Eastern Green Link 4 (EGL 4) English Onshore Scheme, with respect to health and wellbeing, including physical and mental health in relation to both the general population and vulnerable populations. The preliminary assessment is based on information obtained to date. It should be read in conjunction with the description of the Projects provided in **Volume 1, Part 1, Chapter 4: Description of the Projects.**

16.1.2 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, environmental measures, and the preliminary health and wellbeing effects that could result from the English Onshore Scheme during the construction and operation (and maintenance) phases. Specifically, it relates to the English onshore elements of EGL 3 and EGL 4 (the English Onshore Scheme) landward of Mean Low Water Springs (MLWS).

16.1.3 This chapter should be read in conjunction with:

- **Volume 1, Part 2, Chapter 08, Landscape and Visual Amenity** (due to the association between some landscape receptors and activities that benefit physical and mental health e.g. exercise, recreation etc, as well as protective factors for mental health);
- **Volume 1, Part 2, Chapter 09, Water Environment** and **Chapter 10, Geology and Hydrogeology** (due to the potential for water availability and quality, as well as contamination, to affect human health);
- **Volume 1, Part 2, Chapter 12, Traffic and Transport** (due to the potential for traffic/plant emissions associated with the English Onshore Scheme to adversely affect habitats, flora and fauna, and potential for road traffic collisions with fauna associated with the English Onshore Scheme);
- **Volume 1, Part 2, Chapter 13, Noise and Vibration** and **Chapter 14, Air Quality** (due to the potential for emissions associated with the English Onshore Scheme to adversely affect human health); and
- **Volume 1, Part 2, Chapter 15, Socio-economics, Recreation and Tourism** (due to the association between socio-economic activity and recreation and the wider determinants of health).

16.1.4 This chapter is supported by the following figures:

- **Volume 3, Part 2, Figure 16-1: Health and Wellbeing Study Area**; and
- **Volume 3, Part 2, Figure 16-2: Health and Wellbeing Receptors**.

16.1.5 This chapter is supported by the following appendices:

- **Volume 2, Part 1, Appendix 1.2.A: Regulatory and Planning Context**;

- **Volume 2, Part 1, Appendix 1.5.A: Schedule of Design Measures**; and
- **Volume 2, Part 1, Appendix 1.5.B: Outline Code of Construction Practice (CoCP)**.

Limitations

16.1.6 The information provided in this Preliminary Environmental Information Report (PEIR) is preliminary, the final assessment of potential significant effects will be reported in the Environmental Statement (ES). The PEIR has been produced to fulfil NGET's consultation duties in accordance with Section 42 of the PA2008 and enable consultees to develop an informed view of the preliminary significant effects of the English Onshore Scheme.

16.1.7 This assessment has been undertaken as a desk-based study, using publicly available information. No site survey has been undertaken for the purpose of this chapter. However, this is not considered to affect the robustness of the assessment supporting the PEIR given the required datasets have been obtained from public datasets such as those maintained by government.

16.1.8 This assessment has relied, in part, on data provided by third parties (e.g. Ordnance Survey Mapping, Office for National Statistics [ONS]), which are the most up-to-date data available at the time of writing. No significant changes or limitations in these datasets have been identified that would affect the robustness of the assessment. Baseline data will be kept under review throughout the production of the EIA to ensure that (where practicable) the most recently published data is utilised.

16.1.9 Any assumptions and limitations related to the assessment and data collection for other topic chapters and utilised in this chapter are also applicable.

Preliminary significance conclusions

16.1.10 For ease of reference, a summary of the significant and potentially significant effects from the preliminary health and wellbeing assessment is provided in **Table 16-1.** All other effects in relation to health and wellbeing have been assessed as not significant. Further details of the methodology behind the assessment and a detailed narrative of the assessment itself are provided within the sections below.

Table 16-1 – Preliminary summary of significance of effects

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor[1]	Magnitude of change[2]	Significance[3]	Summary rationale
Physical and mental health – health-related environmental change to the PRoW network – vulnerable groups	Medium, as the study area contains a higher than the national average number of people with mental health disorders.	Low/Medium, as effects are expected to be temporary, low in frequency and small-scale, however, the magnitude of effect experienced by the vulnerable populations may be greater than experienced by the general population.	Minor/Moderate (Significant – on the basis that the effect may be experienced differently by vulnerable populations) Until further Air Quality and Noise modelling is undertaken, the significance of effect cannot be fully confirmed.	Uncertainty surrounding the English Onshore Scheme could lead to a reduction in use of the PRoW network, particularly where dust or traffic is visible to users of the road network or PRoW, or those who are close to construction work. Where HGVs and a reduction in safe walking routes and smaller pavements would occur, feelings of fear and intimidation may particularly affect wheelchair users, or parents with prams, each of whom would be vulnerable road users. These risks will be monitored and mitigated through the provisions of **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP**. There will be ongoing consultation and opportunity to provide feedback to the

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor[1]	Magnitude of change[2]	Significance[3]	Summary rationale
				construction teams, as set out within the Code of Construction Practice. Effects are expected to be temporary, low in frequency and small-scale.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 16.9** and is defined as very low, low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 16.9** and is defined as negligible, low, medium and high.
3. The potential significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), major/moderate (significant), moderate (significant), moderate/minor (potentially significant), minor (not significant), minor/negligible (not significant) or negligible (not significant), subject to the evaluation methodology outlined in **Section 16.9**.

16.2 Relevant technical guidance

16.2.1 The legislation and planning policy which has informed the assessment of effects with respect to health and wellbeing is provided within **Volume 2, Part 1, Appendix 1.2.A: Regulatory and Planning Context**. Further information on policies relevant to the English Onshore Scheme is provided in **Volume 1, Part 1, Chapter 2: Regulatory and Policy Overview.** Relevant technical guidance, specific to health and wellbeing, that has informed this PEIR and will inform the assessment within the ES is summarised below.

Technical guidance

16.2.2 A summary of the technical guidance for health and wellbeing is given in **Table 16-2.**

Table 16-2 – Technical guidance relevant to the health and wellbeing assessment

Technical guidance document	Context
Healthy Lives, Healthy People: Our Strategy for Public Health in England, HM Government, (2011) (Ref 16.1)	This white paper sets out the approach to reduce inequalities in health and address the root causes of poor health and wellbeing.
A Green Future: Our 25 Year Plan to Improve the Environment, Department for Environment, Food and Rural Affairs, (2018) (Ref 16.2)	The Plan sets out the proposals to open up the mental and physical health benefits of the natural world through the 25-year plan for improving the environment.
Planning Practice Guidance (PPG) – Healthy and Safe Communities, Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, (2014, as amended2022) (Ref 16.3)	The guidance sets out the importance of considering planning and health together by creating healthy environments that support and encourage healthy lifestyles and by identifying and securing facilities for primary, secondary and tertiary care.
Putting Health into Place, Public Health England (PHE) (2018) (Ref 16.4)	The guidance explains the relationship between health and development, including key actions for developers to align approaches to address the root causes of preventable health conditions and poor wellbeing.
Health Impact Assessment in spatial planning A guide for local authority public health and planning teams, PHE (2020) (Ref 16.5)	This guide illustrates the process for conducting Health Impact Assessments to address local health and wellbeing needs and tackle inequalities.
Advice on the content of Environmental Statements accompanying an application under the NSIP Regime, PHE (2021) (Ref 16.6)	PHE explains the required methodology for assessing impacts within this advice note, alongside defining potential significant effects and vulnerable groups.
Health in Environmental Impact Assessment A Primer for a Proportionate Approach, Institute	The IEMA guidance aims to guide EIA coverage of population and human health,

Technical guidance document	Context
of Environmental Management and Assessment (IEMA) (2017) (Ref 16.7)	focusing on proportionality and the opportunities and challenges presented.
Effective Scoping of Human Heath in Environmental Impact Assessment, IEMA (2022) (Ref 16.8)	This scoping guidance explains when an EIA chapter should be prepared and when a standalone Health Impact Assessment (HIA) would be required. The expectation is that the EIA Report will include a chapter on human health where: • Wider determinants of health not covered by other EIA technical topics have been scoped in; or • Other EIA technical topics have been scoped in to assess likely and potentially significant effects to human receptors, community amenities or services; and there are likely and potentially significant population health implications from such assessments. *"If the implications of other EIA technical topics for population health are not clear at the scoping stage, then an EIA Report health chapter should be included, and once the further assessment detail for those topics is available, explain whether or not there are likely and significant population health effects".* Additionally, the guidance outlines the relationship of HIA and EIA where there is a policy or validation requirement to undertake HIA. The guidance explains that *"EIA projects should normally meet this through the EIA Report health chapter where significant health effects are likely to occur. Where the EIA follows IEMA guidance the health chapter will align to HIA principles, including considering wider determinants of health and health inequalities".*
Determining Significance for Human Health in Environmental Impact Assessment, IEMA (2022) (Ref 16.9)	This guidance promotes greater consistency in the assessment process, including how EIA health conclusions are reached, interpreted and used by all parties. This guidance explains how the magnitude of effect and sensitivity of receptors is applied to human health. Methodologies are set out and significance criteria established.

Technical guidance document	Context
Mental Wellbeing Impact Assessment (MWIA) – a toolkit for wellbeing, National MWIA Collaborative (England) (2011) (Ref 16.10)	This MWIA toolkit for wellbeing provides an evidence-based framework for improving wellbeing. The MWIA screening toolkit has been designed to assist policies, services, programmes or projects, to begin to find out how they might make a difference through using MWIA.
Guidelines For Limiting Exposure to Time-Varying Electric, Magnetic And Electromagnetic Fields (Up To 300 GHz), International Commission on Non-Ionizing Radiation Protection (ICNIRP), (1998) (Ref 16.11)	The ICNIRP establishes guidelines for limiting EMF exposure that will provide protection against known adverse health effects. The guidance presents basic restrictions on exposure and reference levels for compliance.
Fair Society, Healthy Lives: The Marmot Review, Institute of Health Equity (2010) (Ref 16.12)	The Marmot Review was commissioned to undertake a review into inequality and its relation to health. The Review concludes with policy recommendations to address the findings, including creating healthy and sustainable communities, giving children the best start in life and ensuring a healthy standard of living for all. These each includes a number of policy objectives.
Health Equity In England: The Marmot Review 10 Years On, Institute of Health Equity (2020) (Ref 16.13)	Building on the work of the 2010 Marmot review, the 2020 report examines why life expectancy has stalled in England and how health inequalities have grown in the previous decade. The policy objectives from the 2010 report are developed further to clarify objectives.

16.3 Consultation and engagement

Overview

16.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 5.9** of **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**.

Scoping Opinion

16.3.2 A Scoping Opinion was adopted by the Secretary of State, administered by the Planning Inspectorate, on 05 September 2024. A summary of the relevant responses received in the Scoping Opinion in relation to health and wellbeing, and confirmation of how these have been addressed within the assessment to date, is presented in **Table 16-3.**

16.3.3 Since issue of the Scoping Opinion changes to the Projects design has resulted in Fenland District Council and Cambridgeshire County Council falling within the draft Order Limits. Whilst the preliminary assessment has taken account of the relevant

baseline information for these local planning authorities the scope of the assessment remains unchanged.

16.3.4 The information provided in the PEIR is preliminary and not all the Scoping Opinion comments have been addressed at this stage, however all comments will be addressed within the ES.

Table 16-3 – Summary of EIA Scoping Opinion responses for health and wellbeing

Consultee	Consideration	How addressed in this PEIR
the Planning Inspectorate	Clarity requested on how the study area for the assessment relates to the study areas for other topic chapters	Where potential effects from health-related environmental change are identified, baseline information on the affected receptor population will be included in the health and wellbeing baseline.
UK Health Security Agency (UKHSA)	Inclusion of information relating to health assessment in single chapter in the ES	In line with the Scoping Report, it is proposed that a health and wellbeing chapter will be provided in the PEIR and ES, utilising information from other technical aspect chapters in relation to health-related environmental change and on the basis that the health and wellbeing chapter collates these assessments. The chapter will provide clear cross-references to related topic chapters within the PEIR and ES to minimise duplication and signpost to health-related information.
	Emissions related to road traffic, such as particulate matter and oxides of nitrogen, should be considered in the health and wellbeing assessment	Consideration of changes in air quality as a result of the English Onshore Scheme, and associated changes in physical and mental health, will be addressed in the health and wellbeing PEIR, with updates provided in the ES chapter.
Office for Health Improvement and Disparities (OHID)	Scope of health determinants comprising access, traffic and transport, socioeconomic and land use	The health and wellbeing PEIR chapter will collate and present information on the impacts arising from health-related environmental change during construction and operation, drawing on the assessments of other environmental topics, to identify and assess the impact on relevant determinants of health. This will further be updated within the health and wellbeing ES chapter.
	The opportunity to discuss specific elements of the English Onshore Scheme alongside local Directors of Public Health	Following the circulation of the Health and Wellbeing technical note, a meeting will be proposed to gather feedback and answer specific queries from stakeholders on the proposed approach.

Consultee	Consideration	How addressed in this PEIR
	The OHID provided guidance on their expectations on the reporting structure of the ES.	This guidance provided by the OHID is noted and has been fed back to the EIA coordination team.
	Identification of vulnerable populations and disproportionate impacts.	As part of the ongoing work to understand the impacts of a project of this nature, National Grid Electricity Transmission plc (NGET) will ensure due regard is given to the requirements of the Equality Act (2010) and the need to understand how people with protected characteristics may be impacted differently as a result of the English Onshore Scheme. NGET has been closely monitoring feedback received from non-statutory consultation. As the design is progressed, further consideration will be given to potential equalities impacts through the EIA process, with specific reference within the assessments presented in the health and wellbeing chapter and **Volume 1, Part 2, Chapter 15, Socio-economics, Recreation and Tourism**.
Bilsby & Farlesthorpe Parish Council East Lindsey District Council	Requested details including the impact on local medical and mental health and access to emergency services.	The assessment will identify and assess potential impacts on physical and mental health arising from the English Onshore Scheme. Information relating to traffic and transport will be used to identify whether there will be any change to access and the potential for associated impacts on health.
Boston Borough Council	Uncertainty about physical health impacts of pylon structures, as well as mental health impacts associated with the English Onshore Scheme.	The assessment will identify and assess potential impacts on physical and mental health arising from the English Onshore Scheme, including above ground assets. Evidence of compliance of the English Onshore Scheme with EMF exposure requirements will be provided for context and to aid understanding with regards to the lack of physical health impacts.

Consultee	Consideration	How addressed in this PEIR
Holbeach Parish Council	Concern noted about the potential health impacts associated with construction traffic routes. Requested further information about EMF from underground cables.	The potential for physical and mental health impacts arising from construction traffic will be addressed, drawing on information on related ES topic chapters such as, but not limited to, Air Quality, Noise and Vibration, Landscape and Visual, Traffic and Transport. Evidence of compliance of the English Onshore Scheme with EMF exposure requirements will be provided for context and to aid understanding with regards the lack of physical health impacts.
Lincolnshire County Council	Requested a health impact assessment approach taken to writing this chapter, taking account of the demographic and health profiles of the populations in the health and wellbeing study area. Acknowledged the potential for impacts from construction activities as well as the perceived risk of EMF on mental health. Health-related environmental change noted in relation to access to green space for recreation, the PRoW network and views, as well as a concern in relation to availability of high-grade agricultural land for food production. Suggested that the health and wellbeing baseline be increased in granularity to ward level.	In line with IEMA guidance on the assessment of health impacts, a separate HIA is not proposed to avoid duplication. The EIA will incorporate the principles of a HIA, and the assessment will be presented in the health and wellbeing PEIR and ES chapters. The approach will incorporate the requested information on the potential for physical and mental health impacts arising from the English Onshore Scheme, both positive and adverse, including those from health-related environmental change by drawing on the findings in related topic chapters, as well as cumulative effects. The baseline will take account of both demographic and health profiles, as well as identifying vulnerable populations and the potential for inequalities. It will also be informed by stakeholder consultation and engagement, such as this, which is already improving the policy base and baseline information for the assessment. Evidence of compliance of the English Onshore Scheme with EMF exposure requirements will be provided for context and to aid understanding with regards the lack of physical health impacts. Regardless, it is acknowledged that there remains the potential for impacts to mental health associated with the perceived risk from EMF on receptors and the health and wellbeing chapter of the

Consultee	Consideration	How addressed in this PEIR
		PEIR and ES will therefore present an assessment of this. Given the size of the study area, the baseline will generally be presented at district level to aid understanding. Where impacts are identified, additional information from the ward level will be incorporated to understand population receptors in more detail, particularly vulnerable groups, how they will be impacted and to identify disproportionate effects and inequalities.
Norfolk County Council	Requested an HIA covering construction and operation phase impacts, including to vulnerable communities, from changes in air quality, noise, vibration and traffic, as well as to PRoW, on both physical and mental wellbeing, as well as cumulative effects. Concerns noted around the potential for mental health impacts arising from the perceived risk from EMF.	In line with IEMA guidance on the assessment of health impacts, a separate HIA or mental health assessment is not proposed to avoid duplication. The EIA will incorporate the principles of a HIA and the assessment presented in the health and wellbeing PEIR chapter. The approach will incorporate the requested information on the potential for physical and mental health impacts arising from the English Onshore Scheme, both positive and adverse, including cumulative effects. An update will be provided for the ES chapter.
Theddlethorpe Parish Council	Concerns noted in relation to potential impacts from EMF, particularly in relation to primary schools.	Evidence of compliance of the English Onshore Scheme with EMF exposure requirements will be provided for context and to aid understanding with regards the lack of physical health impacts. Regardless, it is acknowledged that there remains the potential for impacts to mental health associated with the perceived risk from EMF on receptors, and the health and wellbeing chapter of the PEIR and ES will therefore present an assessment of this.

Technical engagement

16.3.5 Technical engagement with consultees in relation to health and wellbeing is ongoing. A summary of the technical engagement undertaken to date [17 March 2025] is outlined in **Table 16-4.**

Table 16-4 – Technical engagement on the environmental aspect assessment

Consultee	Consideration	How addressed in this PEIR
UKHSA and OHID Lead Planners, Directors of Public Health and health officers at all host local planning authorities (these comprise East Lindsey District Council, Boston Borough Council, South Holland District Council, Borough Council of King's Lynn & West Norfolk and Fenland District Council), as well as Lincolnshire, Cambridgeshire and Norfolk County Councils	A technical note was shared with these consultees in March 2025, setting out details of methodology, scope and addressing comments raised during statutory consultation.	The PEIR assessment will be undertaken in line with the methodology laid out within the technical note. Feedback received from the stakeholders will be discussed as part of ongoing engagement on the scope of the health and wellbeing assessment and reflected in the ES.

16.3.6 Engagement with local planning authorities, Parish Councils and the communities will continue to inform the ES through the formal consultation process. Statements of Common Ground will be used to record engagement and ongoing discussions with these stakeholders throughout the DCO process.

16.4 Data gathering methodology

16.4.1 The known and predicted current and future baseline environment described in this section has been characterised by a desk study. The data sources used have been detailed in **Table 16-5**.

Study area

16.4.2 The study area for the health and wellbeing assessment has been defined using professional judgement and experience of similar linear projects and is defined by local authority boundaries. The draft Order Limits includes the following local authorities and is shown on **Volume 3, Part 2, Figure 16-1: Health and Wellbeing Study Area**:

- East Lindsey District Council;
- Boston Borough Council;
- South Holland District Council; and
- Borough Council of King's Lynn & West Norfolk.

16.4.3 Baseline data has additionally been collected for Fenland District Council area, due to the proximity of the draft Order Limits.

16.4.4 Where the assessment of health-related environmental change relies on data from other topic chapters, the study area for that chapter will be referred to in the assessment. Where impacts are identified, additional information will be incorporated to understand population receptors in more detail, particularly vulnerable groups, how they will be impacted, and to identify disproportionate effects and inequalities. This could include information at Ward level.

16.4.5 Previous studies and calculations (Ref 16.14) have shown that equipment operating at the proposed voltage and rating does not produce EMF greater than typical background levels at distances of more than 200 m. Whilst the potential for effects on physical health arising from EMF has been scoped out, it is recognised that there remains the potential for effects on mental health arising from perceived risk. Due to the nature of mental health effects, it is not possible to apply a study area.

Desk study

16.4.6 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 16-5.**

Table 16-5 – Data sources used to inform the health and wellbeing assessment

Organisation	Data source	Data provided
ONS (Ref 16.15)	Census 2021	Population profiles for age and population densities for local authorities in England Population profiles for ethnic groups Life expectancy for local authorities in England Rates of income deprivation for the study area
OHID (Ref 16.16)	Public Health data profiles	Local health profiles for local authorities and populations, including prevalence of disease and disability and weight indicators.
National Grid Electricity Transmission	EGL 3 and EGL 4 PEIR: • **Volume 1, Part 2, Chapter 08, Landscape and Visual Amenity**; • **Volume 1, Part 2, Chapter 09, Water Environment**; • **Volume 1, Part 2, Chapter 10,**	Baseline information from related topic chapters.

Organisation	Data source	Data provided
	Geology and Hydrogeology; • **Volume 1, Part 2, Chapter 12, Traffic and Transport**; • **Volume 1, Part 2, Chapter 13, Noise and Vibration**; • **Volume 1, Part 2, Chapter 14, Air Quality;** and • **Volume 1, Part 2, Chapter 15, Socio-economics.**	

Survey work

16.4.7 This assessment has been undertaken as a desk-based study, using publicly available information. No site survey has been undertaken for the purpose of this chapter.

16.5 Overall baseline

Current baseline

16.5.1 The health baseline of the study area has been gathered and shows varying characteristics and challenges (Ref 16.15, Ref 16.16). The baseline sets out the wider health context required to inform the assessment, covering both physical and mental health. This information has been used as a basis for determining the sensitivity of receptors to changes in health determinants arising from the English Onshore Scheme.

Health-related environmental change

16.5.2 Population, recreation and deprivation data are described in **Volume 1, Part 2, Chapter 15, Socio-economics, Recreation and Tourism**. Baseline information relating to health-related environmental change is set out in the following chapters:

- **Volume 1, Part 2, Chapter 08, Landscape and Visual Amenity**;
- **Volume 1, Part 2, Chapter 09, Water Environment**;
- **Volume 1, Part 2, Chapter 10, Geology and Hydrogeology**;
- **Volume 1, Part 2, Chapter 12, Traffic and Transport**;
- **Volume 1, Part 2, Chapter 13, Noise and Vibration**; and
- **Volume 1, Part 2, Chapter 14, Air Quality.**

Age

16.5.3 King's Lynn and West Norfolk, and East Lindsey have an aging population, with 25.9% and 30.4% of residents aged 65 and over respectively, which may be indicative of a lower birth rate, that people move to the area to retire, or conversely, families and younger people are moving out of the area. Statistics for Fenland, Boston and South Holland suggest an opposite trend, with a greater proportion of younger and working age people when compared to King's Lynn and West Norfolk and East Lindsey. However, all the local authority areas have a higher proportion of those aged over 65 than England (17.5%) as a whole (Ref 16.15). Fenland and Boston additionally have the highest population densities of the study area (188 and 194 residents per m^2 respectively), although all of the local authorities studied have a lower population density than that of England as a whole (434 residents per m^2)(Ref 16.15).

General Health

16.5.4 Life expectancy rates within the study area are generally in line with or slightly lower when compared to England. The life expectancy for males in Boston is the most deviated from the national average, at just over two years less than the average for England (76.8 years, compared to 79.1 years for England). The male life expectancy in King's Lynn and West Norfolk slightly exceeds the average for England. For female life expectancy, only King's Lynn and West Norfolk exceeds the England average (83.5 years compared to 83 years for the England average), with the other local authority areas performing worse in this metric when compared to the England national average. The lowest female life expectancy in the study area is in East Lindsey, with 81.1 years (Ref 16.15).

16.5.5 The number of people across the study area living with a limiting illness or disability is higher than the England average (17.6%), with East Lindsey having the highest proportion of its population living with a limiting illness or disability (26%). Conversely, Boston has the lowest proportion (20.2%).

16.5.6 Across child weight indicators, at both Reception-age and Year 6, the study area performed worse than England as a whole with respect to childhood obesity rates (22.6% for Reception-age in England and 35.8% for Year 6). This is particularly evident in Boston (25.8% and 43.8% respectively). This indicates that opportunities for exercise, active travel and outdoor recreation, as well as accessing healthy foods, are a challenge for this area (Ref 16.16).

Mental Health

16.5.7 The number of new referrals to specialist mental health services in Lincolnshire was higher than the national average in all age groups in 2019/20. Rates of probable mental disorders have increased since 2017, from 1 in 9 (2017) to 1 in 6 (2020) children. For children aged 6-16 years in Lincolnshire, an estimated 17.4% are likely to have a 'probable' mental disorder and a further 11.1% are likely to have a 'possible' mental disorder (Ref 16.17).

16.5.8 In Lincolnshire, (which includes East Lindsey District Council, Boston Borough Council and South Holland District Council), 24.5% of people report a high anxiety score, similar to the national average; while 6.2% report a low happiness score, which is better than the England average. The anxiety rate is similar in Cambridgeshire (which includes Fenland District Council) and Norfolk (King's Lynn and West Norfolk), with 22.35% and 22.91% respectively. Lincolnshire is the only county in the study area that performs

better than the England average for happiness scores; 8.8% of people in Cambridgeshire and 8.23% of people in Norfolk report a low happiness score.

16.5.9 The estimated prevalence of depression in adults across the study area varies. In East Lindsey, the proportion of adults with depression is 13%; Fenland is 13.5%. The lowest prevalence in the study area is King's Lynn and West Norfolk, with 10.6% (Ref 16.17).

16.5.10 Within the study area, King's Lynn and West Norfolk has the highest rate of emergency hospital admission for self harm with 255 people per 100,000 (Ref 16.18). Boston has the lowest rate, with 136 people per 100,000. It should be noted that across the study area the rate of emergency admission for self harm is higher for women than for men.

Ethnic Diversity

16.5.11 In terms of ethnic diversity, the whole of the study area has a less diverse population than England as a whole (Ref 16.15). Boston is the most diverse district within the study area, with 94% of the population identifying as white; the England average, in contrast, has 81% of the population identifying as white.

Deprivation

16.5.12 The study area has a varied level of deprivation (Ref 16.19). East Lindsey has the highest rate of income deprivation (16.2%), with Fenland (14%) also having a higher rate than the England average (12.9%). However, all the local authority areas within the study area have a higher rate of fuel poverty when compared to the average for England, indicating that the cost of living has adversely affected this region. East Lindsey and Boston each have over 30% of all children in these areas living in low income families. The only local authority to perform better than the national average on this metric is King's Lynn and West Norfolk (17.7% compared to 20.1% for England as a whole).

Employment

16.5.13 Across the study area, the unemployment rate is higher than the average rate for England (3.8%), except King's Lynn and West Norfolk, which is in line with the England average, and therefore the lowest in the study area. In the study area, Boston has the highest unemployment rate (5.7%). However, long-term unemployment across the study area is roughly equal to or better than that of the national average, at a crude rate of 1.9 per 1000 people (Ref 16.19).

16.5.14 Health and wellbeing statistics show a wide range of socio-economic and health factors affecting different authorities across the study area. The study area presents local authority areas with varying proportions of ages, which represent different challenges in terms of healthcare, education and recreational provision. With the whole of the study area experiencing some level of fuel poverty and varying levels of income deprivation, opportunities for improving income parity are being explored by the local authorities. Similarly, these local policy documents explore the potential expansion of community services to support the population in more deprived areas.

Electric and Magnetic Fields (EMF)

16.5.15 There is existing electricity transmission and distribution equipment in the study area, including 400 kV and 275 kV overhead lines, as well as existing substations at Walpole. The existing electricity infrastructure produces EMFs as it distributes or uses electricity.

16.5.16 Typical EMFs from a 400 kV overhead line are in the range of 5 to 10 microtesla (μT) (magnetic field) and around 5 kV/m (electric field) directly under the overhead line, decreasing to a background level within 150 m of the overhead line. Typical EMFs for a 132 kV overhead line would be 0.5 to 2 μT (magnetic field) and 1 to 2 kV/m (electric field).

16.5.17 Background EMFs are present in most homes. Electrical appliances and wiring normally used in houses generate a magnetic field; the magnetic field level in a house in the UK will typically be about 0.01 to 0.2 μT, with the Earth producing its own magnetic field of around 50 μT (Ref 16.20).

Future baseline

16.5.18 The future baseline is not expected to materially change within the lifecycle of the English Onshore Scheme.

16.5.19 Following the 2008 financial crisis, public spending cuts have reduced access to healthcare across England. The Covid-19 pandemic and subsequent cost of living crisis have further impacted people's lives by reducing access to recreational spaces and opportunities for adequate income. The pandemic has additionally increased the number of people living with limiting illnesses or disabilities, and while these impacts have been witnessed nationwide, the study area is no exception.

16.5.20 A number of policies and strategies are in place across the study area, aiming to address health and wellbeing inequalities and ensure the provision of health services, access to outdoor recreational facilities and improve the mental health and resilience of the population. Opportunities for improving skills and qualifications feature as aims across each of the Local Plans, highlighting the focus on creating resilient and economically active populations, and reducing unemployment levels. In King's Lynn and West Norfolk, for example, the Local Development Framework Core Strategy (Ref 16.21) policies highlight the ageing population and the demand that this places on healthcare, while the Lincolnshire District Councils' Health and Wellbeing Strategy (Ref 16.22) places emphasis on economic inclusion to support local populations.

16.5.21 It is recognised that there are a number of other proposed and committed developments within the surrounding area that could alter the future baseline in the absence of the English Onshore Scheme. The potential for cumulative effects will be considered in the ES according to the approach outlined within **Volume 1, Part 4, Chapter 28, Cumulative Effects**.

16.6 Environmental measures

16.6.1 As set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**, the environmental measures are characterised as design measures or control and management measures. A range of environmental measures would be implemented as part of the English Onshore Scheme and will be secured in the DCO as relevant.

16.6.2 **Table 16-6** outlines how these design and control measures will influence the health and wellbeing assessment. Measures listed in **Table 16-6** have been assigned references, for example (GG01). These align with the references provided in **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP** for ease of cross-reference. Any references identified with ID MT (for example, MT01) include measures which may also be listed in other aspects considered as part of this PEIR and, therefore, have been identified as measures which apply to multiple aspects.

16.6.3 In addition to the measures listed in **Table 16-6**, standard mitigation measures, comprising management activities and techniques, will be implemented during construction of the Projects to limit potential effects through adherence to good site practices and achieving legal compliance. These are listed in **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP** and are not repeated below.

16.6.4 Design measures identified through the EIA process have also been applied to avoid or reduce potential significant effects. Design measures included that a relevant to health and wellbeing) receptors are included in **Table 16-6** below under Design and Operation and are also included in **Volume 2, Part 1, Appendix 1.5.A: Outline Register of Design Measures.**

Table 16-6 – Summary of the environmental measures

Receptor	Potential changes and effects	Embedded measures	ID reference
Construction			
Physical and mental health – health-related environmental change to the PRoW network	Disruption to or severance of PRoW affecting availability and/or use of the network with likely adverse effects on physical and mental health.	All PRoW which have the potential to be impacted by the Projects will be identified in an Outline PRoW Management Plan (PRoWMP). The PRoWMP will set out the measures required (including any potential temporary closures applied for/detailed in the DCO) to ensure that that PRoW remains safe to use and any that any potential disruption PRoW is minimised. All designated PRoW crossing the working area will be managed in discussion with the relevant local authority, with access only closed for short periods while construction activities occur. Any required temporary diversions or closures of PRoW, footways or carriageways undertaken during construction will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns. The signage will display the temporary diversion routes in place.	MT11
Physical and mental health – provision of and access to facilities	Direct impacts to residential areas and facilities used for education, medical and	Construction traffic routes will be selected to avoid impacts on sensitive receptors and communities through routeing plans, restrictions and vehicle choices. Good practice measures outlined within the Outline	MT13

Receptor	Potential changes and effects	Embedded measures	ID reference
	social care, recreation and community activities.	CoCP and Outline Construction Traffic Management Plan (CTMP) would be implemented in order to avoid conflict with Walkers, Cyclists, and Horse Riders (WCHs), local residents, nearby businesses, and other community or tourist users.	
Mental health – perceived risk from EMFs	While the English Onshore Scheme will be designed to have no adverse physical effects on human health resulting from EMFs, the mental health impacts can result in increased stress in the local population, worsening mental health. This could be particularly felt in areas of high prevalence of mental health conditions and vulnerable groups.	Ongoing and effective consultation will be held throughout the planning stages and the construction phase of the English Onshore Scheme, providing the local community with more opportunities for control over the design of the English Onshore Scheme. An EMF compliance report will be produced to accompany the DCO.	HW01
Mental health – participation in consultation and the consenting process	Enhancing control and facilitating participation have a significant influence on the mental wellbeing of individuals and communities by promoting	The consultation process as required for DCO, and allowing ongoing opportunities for feedback through construction, will enable a feeling of control through the planning and construction phases on the English Onshore Scheme.	HW02

Receptor	Potential changes and effects	Embedded measures	ID reference
	inclusion. Lack of control or exclusion is also significant risk factor for poor mental health e.g. depression.		
Physical and mental health of both general population and vulnerable groups - PRoW	Disruption to or severance of PRoW affecting availability and/or use of the network with likely adverse effects on physical and mental health.	Disruption to or severance of PRoW will be avoided as far as possible. Where necessary, suitable diversions would be agreed with the relevant local authority access officer.	HW03
Operation and Design			
Physical health of both general population and vulnerable groups - EMF	At high enough levels*, EMFs can be harmful to human health. Such levels are much greater than those produced by the UK electricity system. *The ICNIRP 'reference levels' for the public, which are the thresholds at which detailed investigations for compliance may be required, are: 100 µT and 5 kV/m for electric fields. Permitted exposure levels are 360 µT and	The Projects design would be compliant with the guidelines and policies relating to electric and magnetic fields which set limits on the permitted emissions, including Technical Specification 1 – Ratings and General requirements for plant, equipment and apparatus for the NGET system (Ref 16.24). These technical specifications and policies ensure that the proposed design would be compliant with the requirements stated in the National Policy Statement (NPS) for Electricity Networks Infrastructure EN-5 (Ref 16.25).	MT01

Receptor	Potential changes and effects	Embedded measures	ID reference
	9 kV/m (Ref 16.23).		
Mental health – health-related environmental change to neighbourhoods	The combination of changes resulting from environmental variation, including from (but not limited to) landscape, noise, air quality, the water environment, or changes to the historic environment can lead to increasing prevalence of mental health conditions and stress.	The English Onshore Scheme have been designed, as much as practicable, to reduce impacts resulting from environmental change through design, e.g. selecting locations which do not impact on historic features, are not prominent within the landscape, and designed to reduce potential noise and vibration effects through the selection of equipment. Where required, environmental measures as detailed within the respective topic chapters will further reduce potential changes and effects.	HW01

16.7 Scope of the assessment

Spatial scope and study area

16.7.1 The spatial scope of the assessment of health and wellbeing covers the area of the English Onshore Scheme contained within the draft Order Limits, together with the Zones of Influence (ZoIs)/study area(s) described as follows. The study areas for health and wellbeing are shown on:

- **Volume 3, Part 2, Figure 16-1: Health and Wellbeing Study Area**; and
- **Volume 3, Part 2, Figure 16-2: Health and Wellbeing Receptors**.

16.7.2 The study area for the health and wellbeing assessment has been defined using professional judgement and experience of similar linear projects and is defined by local authority boundaries.

16.7.3 Where the assessment of health-related environmental change relies on data from other chapters, the study area for that chapter will be referred to in the assessment. Where impacts are identified, additional information will be incorporated to understand population receptors in more detail, particularly vulnerable groups, how they will be impacted, and to identify disproportionate effects and inequalities. This could include information at Ward level. Wards included within the study area include:

- Alford;
- Chapel St Leonards;
- Willoughby with Sloothby;
- Burgh le Marsh;
- Croft;
- Halton Holegate;
- Wainfleet;
- Friskney;
- Old Leake and Wrangle;
- Sibsey and Stickney;
- Fishtoft;
- Swineshead and Holland Fen;
- Kirton and Frampton;
- Five Village;
- Moulton, Weston and Cowbit;
- Whaplode and Holbeach St John's;
- Holbeach Hurn;
- Fleet;
- Gedney;
- Long Sutton;
- Sutton Bridge;
- Roman Bank; and
- Walsoken, West Walton and Walpole.

16.7.4 The Scoping Report set out that previous studies and calculations (Ref 16.26) have shown that equipment operating at the proposed voltage and rating does not produce EMFs greater than typical background levels at distances of more than 200 m. The English Onshore Scheme will be required to comply with EMF compliance limits, and therefore, there will be no direct impacts to physical health arising from EMF. A study area for EMF is therefore not required.

16.7.5 Whilst the potential for effects on physical health arising from EMF has been scoped out, it is recognised that there remains the potential for effects on mental health arising from perceived risk, although it is not possible to assign a geographical study area for the study of this effect due to its nature.

Temporal scope

16.7.6 The temporal scope of the assessment of health and wellbeing is consistent with the period over which the English Onshore Scheme would be carried out. It covers the construction of the Projects, which is associated with the potential for typically short-

and medium-term effects, from health-related environmental change on water environment receptors. Short term is defined as having a duration of one year or less, and medium-term effects as having a duration of between one and three years. The operation of the Projects over their lifespan has also been assessed, with 75 years being applied as a lifespan for the purposes of assessing environmental change arising from climate change resilience, in accordance with the requirements of the National Planning Policy Framework (NPPF) (Ref 16.27).

16.7.7 The English Onshore Scheme is expected to have a life span of more than 40 years. If decommissioning is required at this point in time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of two years. Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, it is considered that the potential significance of effects relating to the decommissioning phase would be no greater than those from the construction phase and decommissioning effects are not discussed in detail in this chapter. However, **Table 4.21** in **Volume 1, Part 1, Chapter 4: Project Description** provides a high-level summary assessment of the likely significant effects associated with decommissioning. Furthermore, should decommissioning take place it is expected that an assessment in accordance with the legislation and guidance at the time of decommissioning would be undertaken.

Identification of receptors

16.7.8 The World Health Organisation defines health as a '*state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*'. The range of personal, social, economic, and environmental factors that influence health status are known as health determinants and includes the physical environment, income levels, employment, education, social support, and housing.

16.7.9 The English Onshore Scheme has the potential to give rise to changes in health status by influencing health determinants as a result of health-related environmental change. Such change can affect the health of receptors, identified as the 'general population' and 'vulnerable groups', both physically and mentally, by influencing activities, provision of or access to resources, or protective factors that contribute to health and wellbeing. A vulnerable group may have a higher sensitivity to these changes in health status, by virtue of factors such as age (for example, older people or children), ethnicity, economic factors, disability, sex, or gender.

16.7.10 Health-related environmental change will be identified in the following chapters, with the corresponding physical and mental health effects assessed in the health and wellbeing chapter:

- **Volume 1, Part 2, Chapter 08, Landscape and Visual Amenity**;
- **Volume 1, Part 2, Chapter 09, Water Environment**;
- **Volume 1, Part 2, Chapter 10, Geology and Hydrogeology**;
- **Volume 1, Part 2, Chapter 12, Traffic and Transport**;
- **Volume 1, Part 2, Chapter 13, Noise and Vibration**; and
- **Volume 1, Part 2, Chapter 14, Air Quality**.

16.7.11 The principal health and wellbeing receptors that have been identified as being potentially subject to significant effects are summarised in **Table 16-7**.

Table 16-7 – Health and wellbeing receptors subject to potential effects

Receptor	Reason for consideration
Physical health – general population	The physical health of the general population within the study area.
Mental health – general population	The mental health of the general population within the study area, with respect to the following four protective factors of mental health: enhancing control, increasing resilience, facilitating participation and promoting social inclusion.
Physical health – vulnerable groups	The physical health of vulnerable groups within the study area. A group may be vulnerable or otherwise disadvantaged based on the following characteristics, especially where there is a combination thereof: age, income, discrimination or other social disadvantage, and geographic. This could include the protected characteristics defined by the Equality Act.
Mental health – vulnerable groups	The mental health of vulnerable populations within the study area, with respect to the following four protective factors of mental health: enhancing control, increasing resilience, facilitating participation and promoting social inclusion. A group may be vulnerable or otherwise disadvantaged based on the following characteristics, especially where there is a combination thereof: age, income, discrimination or other social disadvantage, and geographic. This could include the protected characteristics defined by the Equality Act.

Potential effects considered within this assessment

16.7.12 The effects on health and wellbeing of receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 16-8.**

Table 16-8 – Health and wellbeing receptors scoped in for further assessment

Receptor	Likely significant effects
Physical health – health-related environmental change to baseline environmental conditions	Changes in physical health during construction and operation arising from changes in landscape and visual amenity, the water environment, geology and hydrogeology, traffic and transport, noise and vibration and air quality. This would include changes in emissions, the landscape and visual environmental, ground contamination, availability and quality of water resources, journey times and flood risk.

Receptor	Likely significant effects
Physical and mental health – health-related environmental change to the PRoW network	Drawing on the findings of the assessment of traffic and transport, and socioeconomics, recreation and tourism, the assessment will consider the impacts to physical and mental health arising from changes to the PRoW network during construction and operation.
Physical and mental health – provision of and access to facilities	Drawing on the findings of the assessment of potential impacts on socioeconomics, recreation and tourism, the assessment will consider the physical health impacts associated with changes in the provision of or access to education, training, employment, community, medical and recreational facilities, during both construction and operation. In addition, social inclusion is a protective factor for mental health. Opportunities for employment, education and leisure have a positive impact. There is the potential for disproportional impacts on vulnerable groups and inequalities.
Mental health – perceived risk from EMFs	Whilst the English Onshore Scheme will comply with EMF exposure limits and therefore avoid physical health impacts, there remains a perception of risk associated with EMF, which has the potential to impact mental health.
Mental health – health-related environmental change to neighbourhoods	The physical environment in which people live their day to day lives is influenced by (for example) visual amenity, air quality, traffic (including HGV movements) and noise. The assessment will identify where there is likely to be qualitative change in the access within, and amenity and character of neighbourhoods, including combinations of impacts arising from environmental change which may alter people's levels of satisfaction and potential engagement with their living environment.
Mental health – participation in consultation and the consenting process	The extent to which people are involved and engaged in activities outside their immediate household is a protective factor for mental health. This would relate to the positive and adverse aspects of participation in the consenting process itself.

16.7.13 The receptors/effects detailed in **Table 16-9** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant.

Table 16-9 – Summary of effects scoped out of the health and wellbeing assessment

Receptors/potential effects	Justification
Generation of EMFs on physical health	Levels of EMFs likely to be generated by the English Onshore Scheme would be well below the public EMF exposure limits they are required to comply with (see **Table 16-6**). These exposure limits have been set to take account of the evidence of the nature and likelihood of health effects from EMF. There will therefore be no likely significant effect on physical health arising from EMF generated by the English Onshore Scheme.

16.8 Key parameters for assessment

Realistic worst-case design scenario

16.8.1 The assessment has followed the Rochdale Envelope approach as outlined in **Volume 1, Part 1, Chapter 4: Description of the Projects** and **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology** of the PEIR**.** The assessment of effects has been based on the description of the Projects and parameters outlined in **Volume 1, Part 1, Chapter 4: Description of the Projects**. However, where there is uncertainty regarding a particular design parameter, the realistic worst-case design parameters are provided below with regards to health and wellbeing, along with the reasons why these parameters are considered worst-case. The preliminary assessment for health and wellbeing has been undertaken on this basis. Effects of greater potentially adverse significance are not likely to arise should any other development scenario, based on details within the Rochdale Envelope (e.g., different infrastructure layout within the draft Order Limits), to that assessed here be taken forward in the final design of the English Onshore Scheme.

16.8.2 As set out in **Section 4.4** of **Volume 1, Part 1, Chapter 4: Description of the Projects**, at this stage in the design process, four options have been identified with regards to the proposed siting of the Walpole converter stations. All four options (Options A-D) have been included within the baseline study. At this preliminary stage in the design development it is considered that there are no clear differences in effects between the four options for the Walpole converter stations with regards to health and wellbeing receptors, and as such, **Section 16.10** has not made reference to the specific options.

16.8.3 In relation to health and wellbeing the following assumptions are made regarding the Project design parameters to ensure a realistic worst-case assessment has been undertaken.

- The worst-case assumption is that the converter stations may be sited anywhere within the indicative zones for the converter stations considered.
- For construction compounds, the worst-case assumption is that they may be potentially sited anywhere within the extent of the indicative zone for construction compounds identified.

- With regards to mental health, and public participation in the consenting process, it is assumed that consultation is limited to the statutory consultation period.
- With regards to physical and mental health and health-related environmental change, the following parameters have been noted in related topic chapters:
  - **Volume 1, Part 2, Chapter 07 Historic Environment**
    - It is assumed that the maximum building height is 30 m, and the assessment has been done on this basis.
    - The construction compounds could be located anywhere within the field in which they are currently sited.
  - **Volume 1, Part 2, Chapter 08 Landscape and Visual**
    - The worst-case assumption for the PEIR is that no landscape environmental design measures are in place and are not accounted for in the preliminary assessment.
    - For the reinstatement of vegetation lost to construction along the indicative cable route, the worst-case assumption is that the reinstatement boundary hedge planting is achievable but will not include tree planting over easement restrictions for each of the EGL 3 Project and EGL 4 Project cables.
  - **Volume 1, Part 2, Chapter 09 – Water Environment**
    - Construction run off will be managed in line with **Volume 2, Part 2, Appendix 2.9.D: Preliminary Water Environment Design Principles**
  - **Volume 1, Part 2, Chapter 10 Geology and Hydrogeology**
    - No new receptors will be introduced or pathways created following the intrusive ground investigations.
    - Any contamination through the cable trench pathway will be mitigated through engineering design.
    - The entire indicative zone for underground cable assets is to be assessed in relation to the potential impacts on hydrogeology.
  - **Volume 1, Part 2, Chapter 12 Traffic and Transport**
    - Construction traffic forecasts are based on an estimate of construction materials, workforce, and current construction phasing.
    - With regards to construction access routes to the converter stations it is assumed that vehicular access from the major road network will be from either the A47 to the south or A17 to the north therefore we have assigned construction traffic to both routes to assess the reasonable worst case scenario. This is considered to be the worst case as in practice the site will not generate this level of vehicle movements
  - **Volume 1, Part 2, Chapter 13 Noise and Vibration**
    - The lowest threshold criteria from BS 5228-1 has been applied for construction noise along the route

- the locations of the converter stations are based upon the indicative zone for converter stations being considered for all converter station options (converter station options A, B, C and D). Thus, the potential for impacts is considered over a larger area within the PEIR than would be the case in the ES.

– **Volume 1, Part 2, Chapter 14 Air Quality**

- With regards to the indicative zone for converter station options A-D, the siting of these is considered to be inconsequential in relation to air quality at PEIR stage. This is because the construction dust risk assessment undertaken has already identified that high risk control measures are required, based on scale of construction activities required to construct the Projects.
- It has been assumed that construction phase Non-Road Mobile Machinery emissions would occur at the boundary of the indicative zone for construction compounds, owing to uncertainty and lack of information regarding the actual position during the construction phase.

– **Volume 1, Part 2, Chapter 15 Socio-economics**

- The pre-mitigation findings of other topic chapter assessments (incorporating embedded environmental measures) have been considered in relation to significance, in informing the Socio-economics, Recreation and Tourism assessment, as this represents a worst case scenario approach

Consideration of construction scenarios

16.8.4 As detailed in **Volume 1, Part 1, Chapter 4: Description of the Projects**, the timing of construction activities set out within this PEIR is indicative. It has been identified that elements of the Projects could be constructed sequentially or concurrently. To allow for any unexpected circumstances and a realistic worst-case assessment, the impact assessment for the English Onshore Scheme considers the worst-case construction scenario as laid out within each of the other environmental topics to ensure the worst-case scenario for health and wellbeing can be identified and assessed. This is as follows:

- For the assessment of physical and mental health – provision of and access to facilities, a concurrent construction timeline is assumed, as this would result in the loss or diversion of the most PRoW and roads at one time.

16.8.5 For the assessment of health related environmental change, the following worst-case scenarios were assumed in other topic chapters:

- The Health and Wellbeing assessment draws upon the Air Quality, Noise and Vibration, Landscape and Visual, and Traffic and Transport chapters, which assume a peak traffic year of 2031 in order to present a worst case scenario when construction vehicle movements are likely to be greatest.
- A concurrent construction timeline has been assumed within each of the other topic chapters.

16.9 Assessment methodology

Overview

16.9.1 The generic project-wide approach to the assessment methodology is set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**, and specifically in **Sections 5.4** to **5.6**. However, whilst this has informed the approach that has been used in this health and wellbeing assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this health and wellbeing assessment. Details are provided below.

16.9.2 The assessment is based on published IEMA guidance on Determining Significance for Human Health in EIA[Error! Bookmark not defined.] and Effective Scoping of Human Health in EIA[Error! Bookmark not defined.]. The assessment has identified potential effects arising from changes to environmental conditions, affecting the physical and mental health of receptors, because of the English Onshore Scheme with the significance of the effect on a receptor presented during construction and operation (and maintenance) (where relevant), when considered in relation to the sensitivity or value of the receptor and the magnitude of the potential impact.

16.9.3 The EIA follows IEMA guidance and therefore the health and wellbeing assessment will continue to align to HIA principles, including considering wider determinants of health and health inequalities, thereby satisfying the policy requirement for HIA.

16.9.4 The potential mental health effects arising from the English Onshore Scheme, have been assessed specifically in relation to control, resilience and community assets, and participation and inclusion, as set out in the MWIA toolkit.

16.9.5 A conclusion on significance and associated reasoning has been provided in relation to identified receptors and impacts, in accordance with the methodology set out in Section 7 of the IEMA Guide to Determining Significance for Human Health in Environmental Impact Assessment[Error! Bookmark not defined.]. **Tables 16-10** to **Table 16-13** in the following sub-sections summarise the methodology for defining receptor sensitivity, magnitude of impact and significance of effect in relation to health and wellbeing.

Receptor sensitivity/value

16.9.6 **Table 16-10**sets out the indicative criteria that will be used to define the sensitivity of receptor populations.

Table 16-10 – Health sensitivity methodology criteria

Category/level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the English Onshore Scheme); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community

Category/level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
	whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very Low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

Magnitude of impact

16.9.7 **Table 16-11**sets out the indicative criteria that will be used to define the magnitude of impacts on a receptor population.

Table 16-11 – Health magnitude methodology criteria

Category/level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Significance of effect

16.9.8 **Table 16-12** and **Table 16-13** set out the indicative EIA significance matrix used to define a level of significance from receptor sensitivity and impact magnitude, as well as the criteria and reasoning used to determine whether an effect is significant for public health.

Table 16-12 – Indicative EIA significance matrix

		Sensitivity			
		High	**Medium**	**Low**	**Very Low**
Magnitude	**High**	Major	Major/ moderate	Moderate/ minor	Minor/ negligible
	Medium	Major/ moderate	Moderate	Minor	Minor/ negligible
	Low	Moderate/ minor	Minor	Minor	Negligible
	Negligible	Minor/ negligible	Minor/ negligible	Negligible	Negligible

Table 16-13 – Significance conclusion and reasoning related to public health

Category/level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Major (significant)	The narrative explains that this is significant for public health because: • Changes, due to the English Onshore Scheme, have a substantial effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. • Change, due to the English Onshore Scheme, could result in a regulatory threshold or statutory standard being crossed (if applicable). • There is likely to be a substantial change in the health baseline of the population, as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the English Onshore Scheme and changes to health outcomes.

Category/level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
	• In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or population group affected by the English Onshore Scheme.
Moderate (significant)	The narrative explains that this is significant for public health because: • Changes, due to the English Onshore Scheme, have an influential effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size, and as informed by consultation themes among stakeholders, which may show mixed views. • Change, due to the English Onshore Scheme, could result in a regulatory threshold or statutory standard being approached (if applicable). • There is likely to be a small change in the health baseline of the population, as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the English Onshore Scheme and changes to health outcomes. • In addition, health priorities for the relevant study area are of general relevance to the determinants of health or population group affected by the English Onshore Scheme.
Minor (not significant)	The narrative explains that this is not significant for public health because: • Changes, due to the English Onshore Scheme, have a marginal effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size of limited policy influence and/or that no relevant consultation themes emerge among stakeholders. • Change, due to the English Onshore Scheme, would be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable). • There is likely to be a slight change in the health baseline of the population, as evidenced by the effect size and/or scientific literature showing there is only a suggestive relationship between changes that would result from the English Onshore Scheme and changes to health outcomes. • In addition, health priorities for the relevant study area are of low relevance to the determinant of health or population group affected by the English Onshore Scheme.

Category/level	Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Negligible (not significant)	The narrative explains that this is not significant for public health because: • Changes, due to the English Onshore Scheme, are not related to the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size or lack of relevant policy, and as informed by the English Onshore Scheme having no responses on this issue among stakeholders. • Change, due to the English Onshore Scheme, would not affect a regulatory threshold, statutory standard or guideline (if applicable). • There is likely to be a very limited change in the health baseline of the population, as evidenced by the effect size and/or scientific literature showing there is an unsupported relationship between changes that would result from the English Onshore Scheme and changes to health outcomes. • In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the English Onshore Scheme.

Preliminary assessment of cumulative effects

16.9.9 At the current stage of the Projects (PEIR stage), design information for the Projects is insufficient to allow for a robust cumulative assessment to be undertaken. Furthermore, given the current position in relation to baseline data collection, with much of the environmental surveys still to be undertaken during 2025, the baseline identified at this PEIR stage cannot be taken as a complete picture of the potential presence and significance of sensitive receptors. Therefore, a cumulative assessment has not been undertaken at this stage; however, **Volume 1, Part 4, Chapter 28 Cumulative Effects**, presents the long and short lists of 'other developments' which will be considered at the ES stage, and the methodology which allowed for the identification of these other developments, to allow consultation bodies to form a view and provide comment on the other developments included. The long-list will be reviewed and if necessary, updated, in the lead up to the ES, as the Projects design further evolves and in response to any comments raised at statutory consultation.

16.9.10 Combined effects (sometimes called intra-project effects) result principally from different types of impacts from one development acting in combination on a specific receptor. By its nature, the health and wellbeing chapter is cumulative, assessing the combined effects of each of the topic chapters on mental and physical health of the general population and vulnerable groups.

- Combined effects on the local people arising from health-related environmental change (including mental health) during construction and operation (Table 16.14). For further information these impacts, please also refer to:
  - **Volume 1, Part 2, Chapter 08, Landscape and Visual Amenity**;

- **Volume 1, Part 2, Chapter 09, Water Environment;**
- **Volume 1, Part 2, Chapter 10, Geology and Hydrogeology;**
- **Volume 1, Part 2, Chapter 12, Traffic and Transport;**
- **Volume 1, Part 2, Chapter 13, Noise and Vibration**;
- **Volume 1, Part 2, Chapter 14, Air Quality;** and
- **Volume 1, Part 2, Chater 15, Socio-economics**.

16.10 Preliminary assessment of health and wellbeing effects

Physical health – health-related environmental change to baseline environmental conditions

16.10.1 Effects on human health can result from any residual effects associated with other environmental technical topics, if not properly controlled through mitigation. **Table 16-14** provides a summary of health effects related to environmental change to the baseline.

Table 16-14 - Physical health – health-related environmental change to baseline environmental conditions

Topic	Element	Effect	Assessment for general population	Assessment for vulnerable populations
Volume 1, Part 2, Chapter 8 Landscape and Visual Amenity	Visual Effects	The preliminary assessment of receptor grouping, view value, susceptibility and likelihood of potentially significant effects through the construction and operational phase is presented in **Volume 1, Part 2, Chapter 8 Landscape and Visual Amenity, Section 8.11**. Residential and recreational receptors (including PRoW) have been identified as having potentially significant effects through the construction and operational phase. This is particularly prominent at the Walpole B Substation, where views would be impacted up to 1.5 km from Mill Road, Church End.	**Construction phase:** A number of potential significant visual receptor locations have been identified for Landscape and Visual. This includes residential receptors throughout Sections 1-8 and users of the PRoW within the study area (including the England Coastal Path). Potential significant effects have also been identified for visitor and recreational users of three camping sites in Huttoft, where the construction activity could be within 300 m. The potential disruption to PRoW could alter access to routes of exercise and recreation, and have a slight reduction in physical activity in the general population. It should be noted that landscape and visual currently assume that there is no mitigation in place to reduce these potential impacts.	**Construction phase:** A number of potential significant visual receptor locations have been identified for Landscape and Visual. This includes residential receptors throughout Sections 1-8 and users of the PRoW within the study area. The potential disruption to PRoW could alter access to routes of exercise and recreation, and have a slight reduction in physical activity in vulnerable populations, particularly those who are limited in mobility and rely on nearby PRoW for exercise and access. It should be noted that landscape and visual currently assume that there is no mitigation in place to reduce these potential impacts. No significant effects have been identified for Water Environment, Geology and Hydrogeology, Agriculture and Soils or Socio-economics,
Volume 1, Part 2, Chapter 9 Water Environment	Watercourses (quality)	No likely significant effects identified at PEIR stage. There is an associated risk of pollution from construction activities including drilling for trenchless crossings (with potential for outbreaks of drilling muds). These activities have a risk of opening pollution pathways to water environment receptors and human health.		
	Flood Risk and Land Drainage	No likely significant effects identified at PEIR stage. The English Onshore Scheme would introduce new areas of temporary impermeable land cover,		

Topic	Element	Effect	Assessment for general population	Assessment for vulnerable populations
		such as construction compounds and haul routes, along with topsoil stripping and earthworks which could disrupt the current land drainage regime. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. This could have effects on human health, both mental and physical, where there are localised flooding events.	No significant effects have been identified for Water Environment, Geology and Hydrogeology, Agriculture and Soils or Socio-economics, Recreation and Tourism at this stage. Potential significant effects have been identified for Air Quality and Noise and Vibration, however, it should be noted that these are unmitigated effects, and likely will not be significant following completion of modelling with the proposed mitigation. As the design progresses, separation distances between individual receptors and the construction swathe may increase, which will reduce the likelihood of significant effects. For the general population, any changes to air quality can lead to adverse physical health impacts, even where people were previously considered 'healthy'. It is	Recreation and Tourism at this stage. Potential significant effects have been identified for Air Quality and Noise and Vibration, however, it should be noted that these are unmitigated effects, and likely will not be significant following completion of modelling with the proposed mitigation. While no concerns around road safety have been identified at this stage, a full review of HGV movements and road traffic incidents will be undertaken for the ES. If there are any areas within the Study Area where there are underlying road safety issues that could be exacerbated by traffic movements associated with the English Onshore Scheme, then appropriate mitigation measures will be proposed to ensure no adverse effects will occur. The Health and Wellbeing assessment will continue to
Volume 1, Part 2, Chapter 10 Geology and Hydrogeology	Human Health	No likely significant effects identified at PEIR stage, although an intrusive ground investigation is yet to be carried out to confirm the ground conditions and any potential pollution pathways.		
	Controlled Waters	No likely significant effects identified at PEIR stage, although construction works have the potential to result in the mobilisation of pre-existing contamination and subsequently impact the water environment. Likelihood of this occurring is considered low.		
	WFD Groundwater bodies	No likely significant effects identified at PEIR stage. The potential impacts by the construction and installation of the underground cables is negligible, but this subject to change if design and depth proposed changes.		

Topic	Element	Effect	Assessment for general population	Assessment for vulnerable populations
	Trenchless Technologies	The nature of the technology proposed is not known at this stage but may include the use of drilling muds and additives such as bentonite. If not properly controlled, bentonite loss can occur resulting in impacts to controlled waters. While there are no effects identified at PEIR stage, the chapter does not conclude if there would be any potential significant effects.	expected that all dust effects will be managed in line with **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP**, and as such no adverse effects will occur to human health as a result of dust emissions. While no concerns around road safety have been identified at this stage, a full review of HGV movements and road traffic incidents will be undertaken for the ES. If there are any areas within the Study Area where there are underlying road safety issues that could be exacerbated by traffic movements associated with the English Onshore Scheme, then appropriate mitigation measures will be proposed to ensure no adverse effects will occur. The Health and Wellbeing assessment will continue to monitor the outcomes of this review. The general population is assessed as low sensitivity, and as effects will be limited to the construction phase and are transient in nature, the	monitor the outcomes of this review, as vulnerable groups would be expected to be particularly affected by any changes to road safety. As the study area has a higher proportion of the population living with a limiting illness or disability, the sensitivity of this receptor is assessed as Medium, due to the generally poor health status. Construction dust effects are the only effect expected throughout the construction phase, and so the magnitude of impact is Low. The significance of effect is therefore **Minor** and **Not Significant**. **Operational phase:** During the operational phase, no significant effects are reported for Air Quality, Water Environment, Geology and Hydrogeology or Agriculture and Soils. There are additionally no significant effects reported for Landscape and Visual
	People at risk of groundwater flooding	No likely significant effects identified at PEIR stage. This is subject to change if design and hence the depth proposed changes; at time of writing it is unlikely that significant impacts will occur.		
Volume 1, Part 2, Chapter 11 Agriculture and Soils	Agricultural landholdings / land use	No likely significant effects identified at PEIR stage.		
Volume 1, Part 2, Chapter 12 Traffic and Transport	Road Safety	Following a preliminary assessment of personal injury collisions within the study area, it is considered that the frequency, severity, and spatial distribution of collisions do not represent a pattern that indicates there are inherent road safety issues within the study area. Notwithstanding this, a full review, including an analysis of clusters, HGV movements and Killed or Seriously		

Topic	Element	Effect	Assessment for general population	Assessment for vulnerable populations
		Injured will be undertaken in the ES for all links and junctions carried forward for further assessment. This will ensure a comprehensive road safety analysis is undertaken, which is informed by the daily vehicle movements for the construction phase.	magnitude of impact is Low. The significance of effect is therefore **Minor** and **Not Significant**. **Operational phase:** During the operational phase, no significant effects are reported for Air Quality, Water Environment, Geology and Hydrogeology, Traffic and Transport, Noise and Vibration or Agriculture and Soils. There are additionally no significant effects reported for Landscape and Visual Amenity that could present physical harm to the general population. These are therefore not likely to contribute to worsening health outcomes for the general population. The assessment for the operation phase is therefore expected to be **Negligible** and **Not Significant**.	Amenity that could present physical harm to the vulnerable groups. The assessment for the operation phase is therefore expected to be **Negligible** and **Not Significant**.
Volume 1, Part 2, Chapter 13 Noise and Vibration	Construction Noise	Activities associated with enabling works and earthworks, utilities and drainage, foundation works and structural construction maintain the potential for a significant adverse effect with the reasonable inclusion of BPM. However, these impacts all occur at the same residential dwelling, which is located within very close proximity to the indicative zone for converter stations. As the converter station locations are refined in the lead up to the ES, there is a potential that increased separation distances may result between the receptor / NSR and converter station. This would have the potential to reduce the magnitude of the impact, or remove the significant adverse effect entirely.		
Volume 1, Part 2, Chapter 14 Air Quality	Construction Dust Assessment	The dust risk to human health has been identified as Medium Risk within the Air Quality chapter. It is emphasised that this is the unmitigated risk, and it is expected that with the adoption of the		

Topic	Element	Effect	Assessment for general population	Assessment for vulnerable populations
		control and management measures (as outlined within **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP)**, residual effects from construction dust would be considered **Not Significant**		
	Construction Vehicle Emissions: Human Receptors	Air Quality modelling is yet to be undertaken, and it is currently expected that there is potential for impact on human receptors on six roads due to the presence of Air Quality Management Areas (AQMAs) or the predicted increase in traffic. Detailed dispersion modelling to assess potential impacts on human receptors would be undertaken as part of the ES once detailed traffic data is available		
	Non-Road Mobile Machinery and Emergency Generators	Low Lane (Ingleborough) and a handful of sensitive human receptors near construction compounds have been identified as potentially affected by the English Onshore Scheme, however, detailed assessment has not yet been undertaken.		
Volume 1, Part 2, Chapter 15 Socio-economics, Recreation and Tourism	Socio-economics	The preliminary assessment of gross construction employment generation considers that there is the potential for a **minor beneficial (not significant), medium term, temporary effect** during construction.		

Topic	Element	Effect	Assessment for general population	Assessment for vulnerable populations
	Recreation	There is the potential for significant (moderate) adverse effects for some PRoW as a result of amenity effects. This is a preliminary conclusion however and will be revisited and assessed fully as part of the ES chapter.		

Physical and mental health – health-related environmental change to PRoW network

16.10.2 PRoWs are a key aspect of health and wellbeing infrastructure, providing opportunity for all to access recreational facilities, creating free exercise opportunities and a resource for relaxation. PRoWs are particularly useful to more deprived communities, allowing for use by all no matter their socioeconomic background, and are therefore integral to community cohesion and equity.

16.10.3 There are a number of locations where PRoW are crossed by the draft Order Limits, or which pass within close proximity to the draft Order Limits, and there is the potential for temporary disruption to PRoW access for those routes. At time of writing, ProW data is yet to be collected, although **Volume 1, Part 2, Chapter 12 Traffic and Transport** has identified routes with the potential for higher usage.

16.10.4 The incorporation of embedded environmental measures in the form of a PRoW Management Plan to ensure management of these PRoW during the construction stage will be agreed. The principles of management of the PRoW with the potential to be affected will adhere to the following standards and be managed by either: remaining open (either with no intervention, or including marshalling); temporary closure with diversions (including sequenced diversions); or temporary closure without diversion. As such, access will be maintained throughout the construction phase, ensuring no loss of these amenities and maintaining access for all populations.

16.10.5 With these embedded environmental measures, the magnitude of change is anticipated to be low or medium for the majority of PRoW, however the outcome of this assessment is subject to change as the design of the English Onshore Scheme is refined. This will be reviewed in the ES assessment as the design of the English Onshore Scheme evolves, however a preliminary assessment of magnitude indicates that there will be no significant adverse effects in relation to changes in access for WCH due to the presence of construction works and traffic.

Physical and mental health – provision of and access to facilities

16.10.6 During construction, there is the potential for journey times and access to be temporarily affected by an increase in the number of heavy goods vehicles or employee vehicles on the road and temporary traffic management at certain locations. These have the potential to lead to temporary delays and temporarily reduce access to local services, including healthcare facilities, educational facilities and social facilities, which both the general population and vulnerable groups rely on.

16.10.7 This includes affecting emergency response times or non-emergency treatment outcomes associated with delays or non-attendance caused by increased traffic and journey times. Effects can be considered most prevalent for people living in deprived areas within close proximity to the construction areas, particularly people with long-term illnesses and carers, as well as users of ambulance services.

16.10.8 Similarly, the study area performs worse when compared to the national average for happiness scores and anxiety. The effect of increasing journey times can lead to stress and frustration, which may lead to worsening mental health in users of the road network. Reducing access or making it harder to access educational, healthcare and social facilities removes opportunities to release stress, possibly further affecting health in an already vulnerable population.

16.10.9 The proportion of people within the study area living with a limiting illness or disability is higher than the England average, and therefore would be considered high sensitivity. The effects would be limited to the construction period and with a minor change to quality of life, but would affect all users of the road network, and would therefore be considered to be low magnitude. The significance is therefore moderate/minor and **not significant** as changes will be within the regulatory threshold for journey times and limited policy interference.

16.10.10 For the general population, journey times could increase, and increases in stress resulting from the increased journey times may reduce mental health resilience. This is however considered to be limited. Suitable alternative routes will be in place to minimise any diversion lengths. As such, the sensitivity of the general population is considered low, and with a low magnitude of impact, resulting in a minor and **not significant** effect.

Mental health – perceived risk from EMFs

16.10.11 Concerns about the potential health effects are often raised when new electricity infrastructure is proposed in an area. The UK has a carefully thought-out set of policies for protecting against physical health impacts arising from EMFs, the main component of which is exposure guidelines. Those exposure guidelines are set by independent scientific bodies and are based on decades-long studies into the effects of EMFs and ill health. After those decades of research, the weight of evidence is against there being any health risks of EMFs below the guideline limits. These policies are incorporated into the decision-making process for Development Consent in National Policy Statement (NPS) EN-5. These policies and guidelines are set to ensure human health is protected against the effects of EMF. All the equipment which forms part of this Project, will be fully compliant with these polices set. This will be fully and publicly documented in the DCO submission.

16.10.12 Although the English Onshore Scheme will be designed to have no physical effects on human health from EMFs, the public perception and understanding of EMFs can lead to concern relating to the operational phase and this has the potential for impacts to mental health outcomes.

16.10.13 Additional mitigation measures to strengthen protective factors to promote mental wellbeing include clear and non-technical information about electrical infrastructure and its compliance with UK guidance. This information demonstrates that any potential EMF risks will have been assessed and do not pose a risk to public health. This information will be presented in the ES and discussed with the public at consultation events. By facilitating engagement and providing opportunities for feedback and to ask questions, the English Onshore Scheme will promote inclusion and enhance control, in line with the protective factors in the MWIA Toolkit.

16.10.14 Recognising that concerns about EMF may adversely impact some people's mental health, National Grid provide open and transparent information about EMFs on the website, www.emfs.info, including what EMFs are, exposures from electricity infrastructure, research into health effects and the policies and guidelines in place to protect against EMF. An EMF helpline is also available to answer any questions or concerns about the subject. In addition, EMF specialists were present at all public consultation events, to address any concerns. These measures are aimed at providing information on EMFs and the measures in place to protect, helping to provide information and inform risk perception around the subject.

16.10.15 The English Onshore Scheme will not be able to fully mitigate these potential mental health impacts, though the consultation and information sharing will go a long way to minimise any potential impacts.

16.10.16 The general population would be considered Low sensitivity, with a Low magnitude of impact due to the minor change in quality of life, with a small minority of the population affected. This would be a minor significance of effect and **not significant**.

16.10.17 Vulnerable groups within the study area, particularly those with existing mental health conditions, would be considered medium sensitivity as they are more likely to have an outlook that is predominantly uncertainty with some concern and with a poor health status. The magnitude of impact is judged to be low due to the minor expected change in morbidity or quality of life. The significance of effect is therefore expected to be minor and **not significant**.

Mental health – health-related environmental change to neighbourhoods

16.10.18 **Table 16-15** below identifies the individual temporary and/or permanent changes identified within other technical chapters. Combined impacts to specific areas as a result of effects identified in other chapters (significant or otherwise) may alter people's levels of satisfaction and potential engagement with their living environment. This will be continually monitored through the ES.

Table 16-15 - Mental health – health-related environmental change to neighbourhoods

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
Volume 1, Part 2, Chapter 8 Landscape and Visual Amenity	Visual Effects	The preliminary assessment of receptor grouping, view value, susceptibility and likelihood of potentially significant effects through the construction and operational phase is presented in **Volume 1, Part 2, Chapter 8 Landscape and Visual Amenity**, **Section 8.11.** Residential and recreational receptors (including PRoW) have been identified as potentially having significant effects through the construction and operational phase. This is particularly prominent at the Walpole B Substation, where views would be impacted up to 1.5 km from Mill Road, Church End.	**Construction phase:** Environmental change throughout the construction phase could occur as a result of changes to Landscape and Visual Amenity, Water Environment, Geology and Hydrogeology, Agriculture and Soils, Traffic and Transport, Noise and Vibration and Socio-economics, Recreation and Tourism. It is the combination of any or all of these potential effects that can impact the mental wellbeing of the general population. As Air Quality and Noise Monitoring are yet to be undertaken, the assessment presented here is incomplete and will be updated at the ES stage.	**Construction phase**: Environmental change throughout the construction phase could occur as a result of changes to Landscape and Visual Amenity, Water Environment, Geology and Hydrogeology, Agriculture and Soils, Traffic and Transport, Noise and Vibration and Socio-economics, Recreation and Tourism. It is the combination of any or all of these potential effects that can impact the mental wellbeing of vulnerable groups. As Air Quality and Noise Monitoring are yet to be undertaken, the assessment presented here is incomplete and will be updated at the ES stage.
Volume 1, Part 2, Chapter 9 Water Environment	Watercourses (quality)	No likely significant effects identified at PEIR stage. There is an associated risk of pollution from construction activities including drilling for trenchless crossings (with potential for outbreaks of drilling muds). These activities have a risk of opening pollution pathways to	Those who own land that is impacted by the construction of the English Onshore Scheme may experience additional stress caused by the loss of livelihood, but this will be compensated accordingly. The	The study area contains a higher than the national average number of people with mental health disorders, although the study area performs better than England as a whole in terms of happiness and anxiety scores.

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
		water environment receptors and human health.	implementation of a Soil Management Plan will also help to reduce fears that the English Onshore Scheme will have longer-lasting impact. For the general population, it is possible that witnessing the construction creates an effect, particularly where dust or traffic is visible to users of the road network or PRoW, or those who are close to construction work. These risks will be monitored and mitigated through the provisions of **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP.** Additionally, effects of fear and intimidation, as identified within **Volume 1, Part 2, Chapter 12** Traffic and Transport could reduce PRoW use as a result of the presence of HGVs and a potential reduction of safe walking routes. The ongoing consultation and opportunity to provide feedback to the construction teams, as set out within the Code of Construction Practice, will help to reduce feelings of	Vulnerable groups are therefore assessed as having a medium sensitivity. Uncertainty surrounding the English Onshore Scheme can lead to reduced use of PRoWs, particularly where dust or traffic is visible to users of the road network or PRoW, or those who are close to construction work. Where HGVs and a reduction in safe walking routes and smaller pavements would occur, feelings of fear and intimidation may particularly affect wheelchair users, or parents with prams, each oof whom would be vulnerable road users. These risks will be monitored and mitigated through the provisions of **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP**. The ongoing consultation and opportunity to provide feedback to the construction teams, as set out within the Code of Construction Practice, will help to reduce feelings of uncertainty.
	Flood Risk and Land Drainage	No likely significant effects identified at PEIR stage. The English Onshore Scheme would introduce new areas of temporary impermeable land cover, such as construction compounds and haul routes, along with topsoil stripping and earthworks which could disrupt the current land drainage regime. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. This could have effects on human health, both mental and physical, where there are localised flooding events.		
Volume 1, Part 2, Chapter 10 Geology and Hydrogeology	Human Health	No likely significant effects identified at PEIR stage. The risk to construction workers and neighbouring residents has been considered given the potential for unforeseen contamination to be encountered during excavation works and the potential exposure to ground gases and vapours associated with landfills, Made Ground,		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
		and/or Peat, in enclosed or confined spaces. The completion of an intrusive ground investigation and the implementation of embedded mitigation measures or environmental controls (such as localised remediation) will ensure any unforeseen contamination is mitigated.	uncertainty. The general population is assessed as low sensitivity in line with the IEMA guidance. As effects are limited to the construction phase, the magnitude of impact is therefore low and the significance of effect is expected to be **Low** and **Not Significant**. **Operational phase:** **For landscape and visual impacts, i**n Sections 6 and 8, potentially significant effects have been identified at a number of receptors. Works to the existing 400 kV overheard line and the Walpole B Substation will be visible from properties, PRoWs and the recreational users of surrounding campsites. At this stage, there are no further topics identifying operational phase effects, and therefore there will be no cumulative effect on neighbourhood quality for the general population.	Effects are expected to be low in frequency and small-scale, however, the magnitude of effect felt by the vulnerable populations may be greater than felt by the general population. As such, the magnitude of impact is expected to be low/medium. This would result in a Minor/**Moderate** significance of effect, which would be **Significant**, as it is possible that there would be a small change in the health baseline of the population. Until further Air Quality and Noise modelling is undertaken, the significance of effect cannot be fully confirmed. **Operational phase:** In Sections 6 and 8, potentially significant effects have been identified at a number of receptors. Works to the existing 400 kV overheard line and the Walpole B Substation will be visible from properties, PRoW and the recreational users of surrounding campsites. At this stage, there are no further topics identifying operational
	Controlled Waters	No likely significant effects identified at PEIR stage. The construction works have the potential to result in pre-existing contamination to be mobilised and subsequently impact the water environment. However, given that the current land use, which is noted as predominantly undeveloped agricultural land, the potential for encountering localised higher risk ground (such as landfills, infilled ponds and Made Ground associated with former structures) is considered to be low.		
	Groundwater extractions	No likely significant effects identified at PEIR stage. It is unlikely that any potential change to the wider groundwater regime will result from the		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
		English Onshore Scheme due to the limited depth of excavation anticipated and hence limited radius of influence. This is subject to change if design and, hence the depth proposed changes.		phase effects, and therefore there will be no cumulative effect on neighbourhood quality for the vulnerable populations. Any identified cumulative effect can have a more adverse impact on vulnerable groups, and this will be explored and assessed further within the ES.
Volume 1, Part 2, Chapter 11 Agriculture and Soils	Agricultural landholdings / land use	No likely significant effects identified at PEIR stage. During construction, agricultural land within the draft Order Limits would be taken out of use, and there would be a temporary and permanent loss of productive agricultural land. The removal of land from an agricultural enterprise would be dealt with through compensation in accordance with the Land Compensation Manual compensation code (which would include consideration of any active agri-environment and/or forestry/woodland schemes). This could impact the mental wellbeing of farmers and landowners due to the loss of production, but this will be monitored throughout the construction of the English Onshore Scheme.		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
Volume 1, Part 2, Chapter 12 Traffic and Transport	Fear and Intimidation	A further effect that traffic may have on pedestrians is fear and intimidation, which is dependent on the following factors: the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by factors such as narrow pavement widths. The preliminary assessment indicates that there are potentially significant effects in relation to fear and intimidation on links (Link 9, Link 35, Link 35A, and Link 50). The potentially affected links form part of construction access route Scarborough Bank, Lynn Road, West Drove North and the A1104.		
	Severance and Pedestrian Delay (incorporating delay to all non-motorised users)	Based on the magnitude of change and the assigned sensitivity of the link the significance of effect in relation to severance and pedestrian delay (incorporating delay to all non-motorised users) is classified as potentially significant on two links (Link 9, Link 35A), as not significant on ten links in relation to the		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
		increase in total vehicles on affected road network. In summary, the preliminary assessment indicates that there are potentially significant effects in relation to severance and pedestrian delay (incorporating delay to all non-motorised users) on links (Link 9, Link 35, Link 35A, and Link 50).		
Volume 1, Part 2, Chapter 13 Noise and Vibration	Construction noise	Although BPM to reduce construction noise impacts would be employed by the Contractor for all work areas, for the purpose of this preliminary assessment it is assumed that no noise mitigation, such as screening, is included. The potential for significant adverse effects during the more sensitive weekend periods remains higher than during the core weekday hours as a result of lower thresholds, with additional, more specific and onerous mitigation measures above standard BPM potentially being required.		
	Construction Traffic	During the peak year of 2031, the construction traffic assessment for the English		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
		Onshore Scheme concludes that four links are predicted to experience a minor change in traffic noise levels, and one link is predicted to experience a major change in road traffic noise level.		
	Construction Vibration	Ground compaction activities during haul road construction results in 21 sensitive receptors predicted to experience potential vibration impacts of moderate or greater, without the inclusion of any BPM mitigation measures. As such, these could present the potential for significant adverse effects due to the proximity of the works to the receptors.		
	Plant facilities	At the time of the production of the PEIR, detailed locations of the converter stations and layouts of any noise emitting plant have not been finalised. As such it has not been possible to quantify the potential noise impacts, consider the requirement for any mitigation or conclude any potentially significant adverse effects.		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
Volume 1, Part 2, Chapter 14 Air Quality	Construction Dust Assessment	The dust risk to human health has been identified as Medium Risk within the Air Quality chapter. It is emphasised that this is the unmitigated risk, and it is expected that with the adoption of the control and management measures (as outlined within **Volume 2, Part 1, Appendix 1.5.B: Outline CoCP)**, residual effects from construction dust would be considered **Not Significant**		
	Construction Vehicle Emissions: Human Receptors	Air Quality modelling is yet to be undertaken, and it is currently expected that there is potential for impact on human receptors on six roads due to the presence of Air Quality Management Areas (AQMAs) or the predicted increase in traffic. Detailed dispersion modelling to assess potential impacts on human receptors would be undertaken as part of the ES once detailed traffic data is available		
	Non-Road Mobile Machinery and	Low Lane (Ingleborough) and a handful of sensitive human receptors near the indicative zone for construction		

Topic	Element	Effect	Cumulative effect on the general population	Cumulative effect on vulnerable groups
	Emergency Generators	compounds have been identified as potentially affected by the English Onshore Scheme, however, detailed assessment has not yet been undertaken.		
Volume 1, Part 2, Chapter 15 Socio-economics, Recreation and Tourism	Socio-economics	The preliminary assessment of gross construction employment generation considers that there is the potential for a minor beneficial (not significant), medium term, temporary effect during construction.		
	Recreation	There is the potential for significant (moderate) adverse effects for some PRoW as a result of amenity effects. This is a preliminary conclusion however and will be revisited and assessed fully as part of the ES chapter.		

Mental health – participation in consultation and the consenting process

16.10.19 Throughout the planning stage of the English Onshore Scheme, there will be opportunity for consultation and engagement between the general population, vulnerable populations, local planning authorities and the design team, through formal consultation channels, such as email and public events.

16.10.20 Non-statutory consultation has already identified areas where further details are required to reassure the communities and have been provided within this PEIR. These details will continue to be developed and explained to the communities. For example, non-statutory consultation identified that there was concern around the potential physical and mental health impacts of pylons and EMFs, and additionally, with construction traffic routes. Further details on local medical and mental health and access to emergency services have been requested and have been provided in **Volume 1, Part 2, Chapter 12 Traffic and Transport**, and will continue to evolve through the design of the English Onshore Scheme.

16.10.21 All representatives of the English Onshore Scheme will be well informed of the project at consultation events, and any concerns raised through consultation or via email will be adequately and appropriately responded to. This will go some way to allay fears by communicating the relevant information effectively and suitably informing consultees, allowing for more control and influence over the English Onshore Scheme and facilitating inclusion and participation.

16.10.22 For the general population, it is expected that the sensitivity is low, due to their predominantly positive outlook and fair health status, with a low impact magnitude due to the expected short duration and slight change in quality of life from perceived stress. As such, the significance of the effect is minor and **not significant**.

16.10.23 For more vulnerable groups within the study area, particularly those with existing mental health conditions would have a medium sensitivity, with a low magnitude of impact due to the minor change in quality of life and the provided opportunity to be involved with the engagement process. This would result in a minor significance of effect which is **not significant.**

16.11 Further work to be undertaken

16.11.1 The information provided in this PEIR is preliminary, the final assessment of significant effects will be reported in the ES. This section describes the further work to be undertaken to support the health and wellbeing assessment presented in the ES.

16.11.2 The Health and Wellbeing PEIR chapter is reliant on the outcomes of the assessments of the other technical topic chapters. As their baseline surveys are continuing to be undertaken and their assessments updated, the health and wellbeing chapter will continue to utilise these changes.

16.11.3 A technical note has been issued to further engage on the topic of health and wellbeing with the local planning authorities. The outcome of this engagement will be recorded and used within the production of the ES.

Baseline

16.11.4 No survey work will be undertaken for the specific health and wellbeing baseline; the ES chapter will, however, draw on the survey results and conclusions undertaken for other technical topics.

Assessment

16.11.5 The assessments undertaken for the PEIR will be reviewed following stakeholder consultation feedback, and further design refinement. Where the assessments set out in the following chapters are updated or where they have not been undertaken for this PEIR, the assessment for health-related environmental change will be reviewed and updated:

- **Volume 1, Part 2, Chapter 08, Landscape and Visual Amenity;**
- **Volume 1, Part 2, Chapter 09, Water Environment;**
- **Volume 1, Part 2, Chapter 10, Geology and Hydrogeology;**
- **Volume 1, Part 2, Chapter 11, Agriculture and Soils;**
- **Volume 1, Part 2, Chapter 12, Traffic and Transport;**
- **Volume 1, Part 2, Chapter 13, Noise and Vibration**;
- **Volume 1, Part 2, Chapter 14, Air Quality** and
- **Volume 1, Part 2, Chapter 15, Socio-economics, Recreation and Tourism.**

16.11.6 The review and update of the health and wellbeing assessment will also consider potential effects on receptors from the River Nene Temporary Quay (as described in **Section 4.5, Volume 1, Part 1, Chapter 4: Description of the Projects**) during the construction of the Projects.

Further environmental measures

16.11.7 Further consultation with relevant statutory consultees would be undertaken to define the scope and extents of the environmental measures set out in the assessment above. If, following stakeholder consultation feedback, further design refinement and further assessment, it is identified that additional measures are required, these will be detailed as part of the ES.

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