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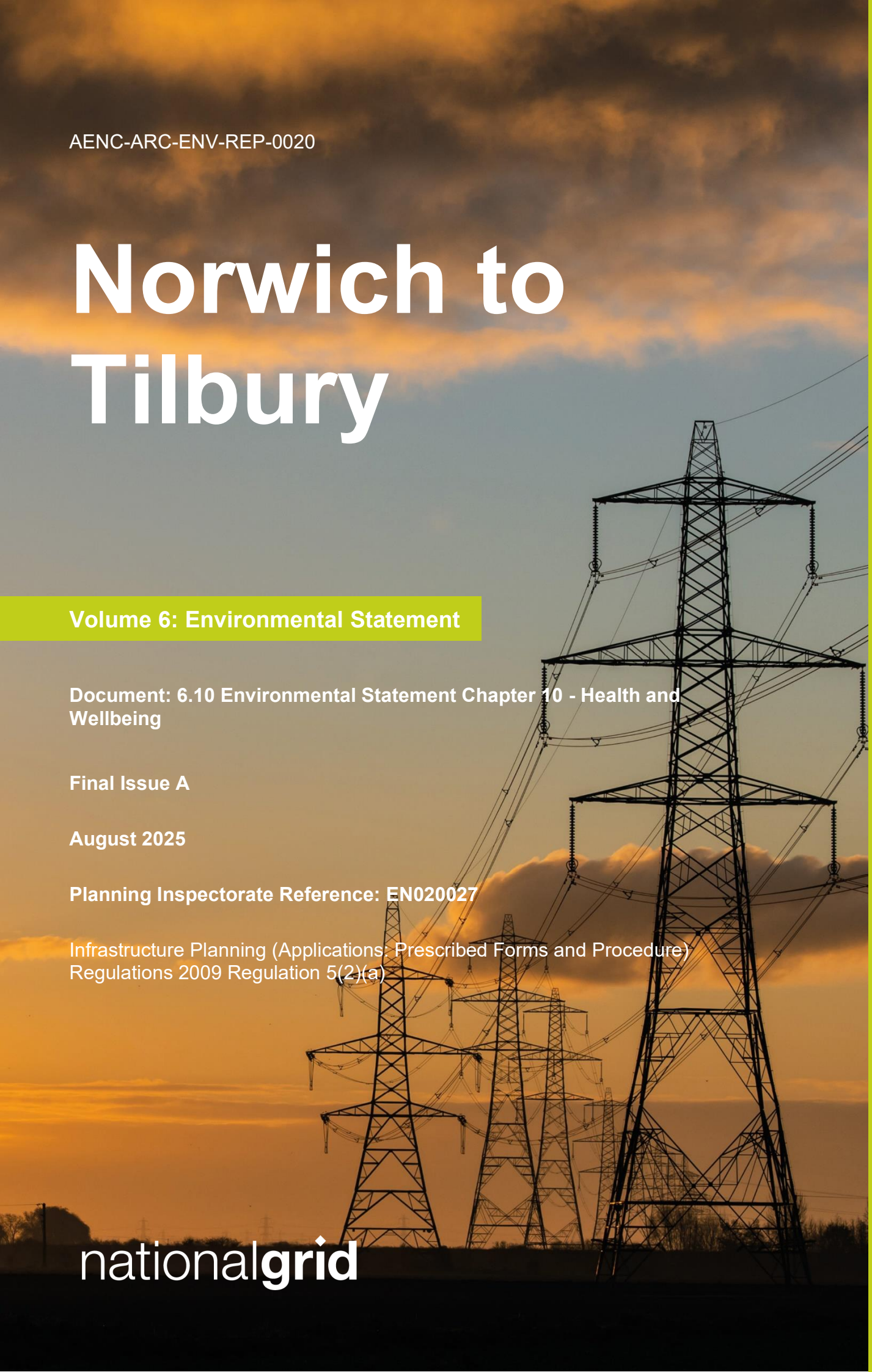

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10. Health and Wellbeing

10.1 Introduction

10.1.1 This chapter of the Environmental Statement (ES) (Volume 6 of the Development Consent Order (DCO) application) details the assessment of the potential residual effects of Norwich to Tilbury ('the Project') on Health and Wellbeing. This chapter covers effects on the following:

- Health-related environmental change (for example, air quality, noise, traffic, and transport related effects), drawing on the assessments of other environmental topics as presented in the ES
- Mental health and wellbeing, including the perceptions of impacts from Electric and Magnetic Fields (EMFs) arising from the Project.

10.1.2 The assessment presents information on the potential impacts to health and wellbeing for receptors including the general population and vulnerable groups / communities (for example those defined by characteristics such as age, ethnic diversity, economic status, disability, sex / gender) who may be disproportionately affected by such changes. The assessment also makes reference to the potential residual effects of the Project related to health inequalities, i.e. the differences in health status or the distribution of health resources across different population groups.

10.1.3 The Health and Wellbeing assessment draws heavily on the assessment outcomes from other ES chapters and related documents, identifying the interrelationships and cumulative effects on identified population groups. This includes the following documents:

- Chapter 6: Agriculture and Soils (document reference 6.6)
- Chapter 7: Air Quality (document reference 6.7)
- Chapter 13: Landscape and Visual (document reference 6.13)
- Chapter 14: Noise and Vibration (document reference 6.14)
- Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15)
- Chapter 16: Traffic and Transport (document reference 6.16)
- Outline Code of Construction Practice (CoCP) (document reference 7.2)
- Outline Construction Traffic Management Plan (CTMP) (document reference 7.3)
- Outline Public Rights of Way (PRoW) Management Plan (document reference 7.6)
- Electric and Magnetic Field (EMF) Compliance Report (document reference 7.8)
- Transport Assessment (document reference 7.11).

10.1.4 This chapter is supported by the following figures and appendices:

- Figure 10.1: Health and Wellbeing Study Areas (document reference 6.10.F1)
- Figure 10.2: Health and Wellbeing Receptors (document reference 6.10.F2)
- Figure 10.3: Indices of Multiple Deprivation Score (document reference 6.10.F3)
- Figure 10.4: Percentage of the Study Area identifying as female (document reference 6.10.F4)
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- Figure 10.10: Percentage of the Study Area considered disabled under the Equality Act (document reference 6.10.F10)
- Figure 10.11: Adult prevalence of overweight (including obesity) in the Study Area (document reference 6.10.F11)
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- Figure 10.13: Population within a 10 minute walk of green or blue space (document reference 6.10.F13)
- Figure 10.14: Crime rate for public order crimes per 1,000 (document reference 6.10.F14)
- Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1).

10.2 Regulatory and Planning Policy Context

National Policy Statement

10.2.1 Chapter 2: Key Legislation and Planning Policy Context (document reference 6.2) sets out the key overarching policy relevant to the Project. Overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2024a) is the key overarching policy relevant to the Project. This is supported by NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2024b).

10.2.2 Full consideration of the relevant NPSs for the Project can be found in Policy Compliance Document (document reference 5.7).

Overarching NPS for Energy (EN-1)

10.2.3 NPS EN-1 (DESNZ, 2024a) contains the following paragraphs relating to Health and Wellbeing which has been considered within this chapter.

10.2.4 Paragraph 4.4.1 of EN-1 states that '*Energy infrastructure has the potential to impact on the health and well-being ("health") of the population. Access to energy is clearly beneficial to society and to our health as a whole. However, the construction of energy infrastructure and the production, distribution and use of energy may have negative impacts on some people's health*'.

10.2.5 Paragraph 4.4.3 of EN-1 states that '*New energy infrastructure may also affect the composition and size of the local population, and in doing so have indirect health impacts, for example if it in some way affects access to key public services, transport or the use of open space for recreation and physical activity*'.

10.2.6 Paragraph 4.4.4 of EN-1 states that '*…where the proposed project has an effect on humans, the ES should assess these effects for each element of the project, identifying any potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate*'.

10.2.7 Paragraph 4.4.5 of EN-1 states '*The impacts of more than one development may affect people simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate*'.

10.2.8 Paragraph 4.4.6 of EN-1 states *'Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society and impacts on those with protected characteristics under the Equality Act 2010, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole'.*

NPS for Electricity Networks Infrastructure (EN-5)

10.2.9 In relation to EMFs, paragraph 2.9.44 of EN-5 states that '*Power frequency EMFs arise from generation, transmission, distribution and use of electricity and will occur around power lines and electric cables and around domestic, office or industrial equipment that uses electricity*'. Paragraph 2.9.46 of EN-5 states that '*EMFs can have both direct and indirect effects on human health….*'.

10.2.10 Paragraph 2.9.48 of EN-5 states that '*To prevent these known effects, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) developed health protection guidelines in 1998 for both public and occupational exposure. These are expressed in terms of the induced current density in affected tissues of the body, 'basic restrictions', and in terms of measurable 'reference levels' of electric field strength (for electric fields), and magnetic flux density (for magnetic fields)*'.

10.2.11 Paragraph 2.9.51 of EN-5 states '*The levels of EMFs produced by power lines in normal operation are usually considerably lower than the ICNIRP 1998 reference levels*'.

10.2.12 This assessment has been carried out in accordance with NPS EN-1 and EN-5.

10.2.13 Full consideration of the relevant NPSs for the Project and this chapter can be found in the Policy Compliance Document (document reference 5.7).

Other National Legislation and Policy

10.2.14 Although the Project will be considered against National Policy stated above, the assessment has also been undertaken in accordance with, and with reference to, the following national legislation and policy:

- The Environment Act 2021 established The Office for Environmental Protection (OEP) as a public body in England and Northern Ireland. One of the objectives of the OEP is for environmental law, and its implementation to be well designed and delivered, so that positive outcomes for the environment and people's health and wellbeing are achieved. This includes the implementation of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 which specifies that direct and indirect significant effects on population and human health must be identified in the Environmental Impact Assessment (EIA) (Part 5(2)(a)).
- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2025) and accompanying planning practice guidance
- Environment Act 1995 - sets provisions for protecting certain environmental conditions of relevance to health in the UK. Part II covers contaminated land and Part IV covers air quality
- Environmental Protection Act 1990 (as amended) - part IIA covers contaminated land and Part III manages the control of emissions (including dust, noise and light) that may be prejudicial to health or a nuisance
- Control of Pollution Act 1974 - makes provisions in relation to waste disposal, water pollution, noise, atmospheric pollution and public health. It describes licensing of certain activities to avoid danger to public health or serious detriment to the amenity of the locality affected. It also covers control of, and consent for, noise on construction sites (s60 and s61), including defining 'best practicable means' (s72)
- Health and Social Care Act 2012 (as amended by the 2022 Act) - s12 and s13 of the Act outline the responsibilities of Local Planning Authorities (LPAs) regarding the safeguarding of public health and the involvement of Integrated Care Boards in planning local healthcare services.

Regional and Local Policy

10.2.15 Chapter 2: Key Legislation and Planning Policy Context (document reference 6.2), the Planning Statement (document reference 5.6) and Policy Compliance Document (document reference 5.7) set out relevant regional and local policy.

10.2.16 Key regional and local policy relevant to Health and Wellbeing, that has informed the assessment within this ES (Volume 6 of the DCO applications) comprising the Joint Strategic Needs Assessments (JSNAs) and health and wellbeing strategies prepared by LPAs to identify local health priorities. A summary of health priorities as outlined in these documents is presented in Table 10.1.

Table 10.1 Health priorities by Local Planning Authority

Local Planning Authority / Strategy Reference	Summary of Health Priorities
Breckland Health and Wellbeing Partnership Strategy 2023-2025 (Breckland Health and Wellbeing Partnership, 2023)	• Tackling health inequalities • Preventing cardiovascular disease (58.9 per 100,000 residents die from cardiovascular disease and 62% adults overweight or obese) • Improving mental health • Tackling issues arising from alcohol dependency and other alcohol related concerns • Low vaccine uptake • Mental health – high levels of social isolation and loneliness, limited access to effective mental health services • Obesity and physical inactivity • Housing and living conditions • Substance misuse and addiction.
Essex Joint Health and Wellbeing Strategy (2022 – 2026) (Essex County Council, 2023)	• Improving mental health and wellbeing • Healthy lifestyles – obesity and physical activity • Levelling up health inequalities – addressing root causes such as poverty, education and housing • Supporting long-term independence • Alcohol and substance misuse • Health inequalities and wider determinants of health.
JSNA 2019 Essex Countywide Report (Essex City Council, 2019)	• Preventative health issues (two thirds of adults overweight and obese) • Poor air quality and noise pollution • Low screening rates for sexual health • Premature mortality – higher than average breast cancer mortality • Life expectancy inequalities • Health inequalities and social isolation • Strategic planning for ageing population • Focus on wider determinants of health – social, economic and environmental factors that influence health including income inequality, air quality, housing and access to services • Low physical activity rates • High suicide rates – four Essex districts are amongst the top 20 in the country for high suicide rates (Tendring, Colchester, Harlow and Brentwood).

Local Planning Authority / Strategy Reference	Summary of Health Priorities
Babergh and Mid Suffolk Health and Wellbeing Strategy 2021-2027 (Babergh District Council, 2023)	• Health and wellbeing inequalities – barriers to accessing healthcare services, particularly in rural areas • Mental health and emotional wellbeing – lack of adequate support systems for vulnerable groups, including children and older people • Social isolation and loneliness – particularly among older residents and those living in rural areas. Push for more community-driven initiatives to foster connection and support • Physical health and lifestyle – obesity, inactivity, and unhealthy eating habits. Limited access to sports and recreational activities, especially in remote areas. Education and community programs to encourage residents to adopt healthier lifestyles • Economic and housing challenges – impact of low incomes and unemployment on wellbeing • Environmental wellbeing – importance of green spaces for physical and mental health. Concerns about air quality and its impact on respiratory health. Sustainable environmental practices to support long-term wellbeing • Access to services – access can be a challenge as well as inclusivity and reaching marginalised populations. • Community resilience and engagement – supporting communities to become more resilient to difficulties such as climate change, economic shocks, and pandemics. Encouraging volunteering and civic engagement to strengthen community bonds • Impact of COVID-19 – Long-term effects of the pandemic on mental health, physical health, and economic stability. Recovery-focused programs to rebuild community trust and resilience. Long term outcomes to 2027 include all communities having sustainable and inclusive places, and spaces, which maximise health and wellbeing opportunities and benefits; and a reduction in health inequalities
Norfolk and Waveney Joint Health and Wellbeing Strategy (2018 – 2022) (Norfolk County Council, 2018)	• Health inequalities – disparities in health outcomes between most and least deprived communities. There are links to higher rates of smoking, unhealthy diets and physical inactivity as well as higher rates of preventable illnesses, violence, drug overdoses, suicide and accidents • Ageing population – increasing demand on health and social care services. Growing prevalence of conditions like multiple morbidity, frailty and dementia • Mental health.

Local Planning Authority / Strategy Reference	Summary of Health Priorities
A Bold and Healthy South Norfolk (South Norfolk Health and Wellbeing Partnership, 2023)	• Mental health and wellbeing: increasing rates of mental health issues such as depression, anxiety, and loneliness, particularly in older adults and young people. • Access and prevention: loneliness, isolation and lack of access and support for older residents • Resilient and healthy communities: supporting the development of healthy places and promoting the use of parks and green spaces. Support for healthy diets and exercise. Cross cutting themes include the cost of living and impacts of COVID-19.
Transitional Integrated Care Strategy and Joint Health and Wellbeing Strategy (Norfolk County Council 2023)	Main goals of the Strategy include to make sure that people can live as healthy a life as possible – preventing avoidable illness and tackling the root causes of poor health. Focal points include tackling the root causes of health inequalities, mental health and wellbeing, supporting healthy ageing, and using digital innovation and access to improve healthcare delivery and accessibility
Thurrock Health and Wellbeing Strategy (Thurrock Council, 2022)	Identifies six domains for health and wellbeing in Thurrock, namely: • Staying Healthier for Longer • Building Strong and Cohesive Communities • Person-Led Health and Care • Opportunity for All • Housing and the Environment • Community Safety.

Guidance

10.2.17 Relevant guidance, specific to Health and Wellbeing, that has informed this ES (Volume 6 of the DCO applications), comprises:

- Health in Environmental Impact Assessment – A Primer for a Proportionate Approach (Institute of Environmental Management and Assessment (IEMA), 2017)
- Effective Scoping of Human Health in Environmental Impact Assessment (IEMA, 2022b)
- Determining Significance for Human Health in Environmental Impact Assessment (IEMA, 2022a)
- Health Impact Assessment in Spatial Planning (Public Health England (PHE), 2020)

- Advice on the content of Environmental Statements accompanying an application under the NSIP Regime (PHE, 2021)
- Mental Wellbeing Impact Assessment (MWIA) – a toolkit for wellbeing (Cooke, *et al*., 2011)
- Health Impact Assessment – a practical guide (Wales Health Impact Assessment Support Unit (WHIASU), 2021)[1].

10.2.18 The Health and Wellbeing assessment has also taken into account relevant local guidance. This comprises the recent Supplementary Guidance Document produced by Suffolk County Council (September 2024) in relation to Community Engagement and Wellbeing which includes a section relating to the assessment of impacts on mental health and community wellbeing. The guidance outlines several key requirements for project promotors, particularly in the context of large infrastructure projects. This includes the need for:

- Effective community engagement
- Procedural fairness
- Wellbeing considerations
- Collaboration with LPAs
- Continuous engagement
- Addressing public perception.

10.3 Scope of the Assessment

10.3.1 The scope of the assessment has been informed by the EIA Scoping Report (document reference 6.19) and EIA Scoping Opinion (document reference 6.20) provided by the Planning Inspectorate in 2022 on behalf of the Secretary of State. The scope has also been informed through consultation and engagement with relevant consultees. A summary of the scope of the Health and Wellbeing assessment is provided in Appendix 5.2: Scope of the Assessment (document reference 6.5.A2).

10.3.2 In addition, the EIA Scoping Opinion, together with a response from National Grid against each point raised by the Planning Inspectorate relevant to Health and Wellbeing, is provided in Appendix 5.1: National Grid's response to the EIA Scoping Opinion (document reference 6.5.A1).

Project Engagement and Consultation

10.3.3 Consultation and engagement with relevant stakeholders has informed the assessment presented in this chapter. Responses to representations received during the statutory consultation in summer 2024 and subsequent consultations in 2025 are provided in Appendix K and M of the Consultation Report (document reference 5.1.1).

[1] WHIASU guidance is widely regarded as good practice for projects across the UK and has applicability outside Wales particularly in relation to the identification of vulnerable groups and wider health determinants. Discussions with stakeholders for this topic (notably a number of Local Planning Authorities) specified use of WHIASU guidance as part of the Health and Wellbeing assessment.

10.3.4 A summary of discussions and how these have influenced the Project, scope and the approach to the assessment is provided in Table 10.2.

Table 10.2 Engagement undertaken relevant to Health and Wellbeing

Reference	Comment	National Grid's Response
Suffolk County Council, September 2023	Suffolk County Council requested consideration of mental health during operation.	An assessment has been undertaken of the potential impacts of the Project on mental health and wellbeing during both construction and operation (and maintenance), the findings of which are presented within relevant assessment sections later in this chapter.
Norfolk County Council, September 2023	Norfolk County Council requested consideration of mental health during operation. The proposed use of the Mental Well-being Impact Assessment (MWIA) collaborative's guidance is welcomed. Mental wellbeing workshops with local communities would be a way of fostering community involvement and building trust, serving to share relevant information and help alleviate concerns that may not be evidence-based. Norfolk also requested that baseline data should be provided to aid further levels of detail where possible.	An assessment has been undertaken of the potential impacts of the Project on mental health and wellbeing during both construction and operation (and maintenance), the findings of which are presented within relevant assessment sections later in this chapter. We note that MWIA workshops would form a preferred part of Public Health Norfolk's approach. However, we understand from statutory and non-statutory consultation already undertaken that the principal concerns of local residents from a mental health and wellbeing perspective centre around stress and anxiety associated with impacts on quality of life / wellbeing once the Project has been constructed (for example, visual impacts on businesses and properties) as well as perceptions of the impacts of EMF on health and wellbeing. Our assessment has therefore identified opportunities for public awareness raising about EMFs, which will form part of measures recommended for affected communities along the proposed route. Baseline data relating to health and wellbeing has been reviewed and supports the assessment. A summary of the health and wellbeing baseline is included in Section 10.5, with full baseline data included in

Reference	Comment	National Grid's Response
		Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1).
South Norfolk Council, September 2023	There is a lack of detail regarding how each environmental topic will be assessed, and the guidance or legislative documentation which will be used in the assessment of each environmental topic.	Further detail relating to guidance and assessment methodology for the Health and Wellbeing topic has been provided within Sections 10.2 and 10.4 of this chapter.
Mid Suffolk District Council and Babergh District Council, September 2023	Mid Suffolk and Babergh District Councils outlined that World Health Organization (WHO) guidance on health should be considered within the assessment.	The Health and Wellbeing assessment is founded on the WHO definition of health, namely *'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'* (WHO, 1948). The chapter has been prepared in line with guidance as set out in Section 10.2.
Thurrock Council, September 2023	Thurrock Council signposted to the WHIASU[2] guidance, particularly in relation to consideration of potentially vulnerable groups. Thurrock Council has provided examples of other baseline metrics which could be used to inform the assessment. Thurrock Council requested that consideration is given to potential health effects to arise during the operational stage of the Project.	Section 10.2 outlines guidance that has been used to inform the assessment, which includes the use of WHIASU guidance in relation to the identification of potentially vulnerable groups and communities. Further detail (for example ward level information) has been incorporated into Section 10.5 and Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1) where relevant. An assessment has been undertaken of the potential impacts of the Project on mental health and wellbeing during construction and operation (and maintenance), the findings of which are presented in this chapter.
UK Health Security Agency, September 2023	The UKHSA outlined that consideration should be given to the document Advice on the content of Environmental Statements accompanying an application under the NSIP Regime (PHE, 2021) within the assessment.	This document and the advice contained within it have been considered as relevant guidance in the preparation of the ES chapter.

[2] WHIASU is the Wales Health Impact Assessment Support Unit that sits in Public Health Wales.

Reference	Comment	National Grid's Response
Chelmsford City Council, October 2023	Chelmsford City Council requested that reference to WHIASU guidance and the vulnerable groups checklist is included within the assessment.	Section 10.2 of this chapter outlines guidance that has been used to inform the assessment, which includes the use of WHIASU guidance in relation to the identification of potentially vulnerable groups and communities.
Basildon Borough Council, October 2023	Basildon Borough Council made comments in relation to vulnerable groups and the need to address the different needs of individual groups (for example older people, children). The methodology should consider how the Project will impact on various aspects of environmental change, for example disruption to green space, traffic and transport effects, potential contamination of water / land and general community disruption.	The Health and Wellbeing assessment has considered how the Project may affect vulnerable groups and communities. The assessment has considered the effects on health and wellbeing arising from environmental change (for example air quality, noise, traffic and transport related impacts such as severance or access to healthcare facilities and greenspace, potential contamination of water / land, and general community disruption), drawing on the assessments of other ES chapters.
All host LPAs, September 2024	Following comments received during statutory consultation, a further technical workshop was held for stakeholders, the purpose of which was to set out further detail relating to the guidance, scope and assessment methodology used for health and wellbeing.	The approach set out in the workshop, which included a focus on wider health determinants, has been extended to the development of the ES chapter.
Thurrock Council, November 2024	Further detail required regarding assessment of the impact of visual amenity loss upon mental health and wellbeing. Request for the assessment to include coverage of the wider determinants of health, including for example impacts arising from changes to Public Rights of Way (PRoWs), impacts on food security. Use of WHIASU population checklist advised for identification of vulnerable population groups.	An assessment relating to the impact of visual amenity loss on mental health and wellbeing has been included within this chapter. The Health and Wellbeing assessment has been structured around the wider determinants of health which includes for example impacts on physical activity (arising from changes to PRoWs) and impacts on food security. WHIASU guidance has been used to identify vulnerable population groups.

Reference	Comment	National Grid's Response
	Identification of sensitive receptors/ vulnerable populations along the route of the Project. Recommended that wards are used to form the geographical basis of the assessment.	Sensitive receptors / vulnerable populations along the route of the Project have been identified in Section 10.5. Where possible, ward-level data has been used to inform the baseline and basis of the assessment.
All host LPAs, December 2024	An additional technical workshop was held for health and wellbeing stakeholders, the purpose of which was to set out further detail relating to the guidance, scope and assessment methodology used for health and wellbeing.	The workshop identified additional sources of baseline information, which have been incorporated into Section 10.5 and Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1) and also identified the importance of a more localised study area to inform both baseline and the assessment of impacts.

10.4 EIA Approach and Methods

10.4.1 This section describes the methodology used to establish the existing and future baseline together with the methodology / approach used to undertake the Health and Wellbeing assessment. The overarching approach is also described in Chapter 5: EIA Approach and Method (document reference 6.5).

10.4.2 Data Sources

10.4.3 The baseline has been informed by a desk study which has drawn on the following key information sources:

- Census 2021 (Office for National Statistics (ONS), 2021)
- Local health data published by the Office for Health Improvement and Disparities (OHID) that provides a wider picture of the health of residents (OHID, 2022)
- Deprivation data from the Ministry of Housing, Communities and Local Government (MHCLG) (MHCLG, 2019)
- Indicator data relating to both physical and mental health and well-being published by the Department of Health and Social Care (Department of Health and Social Care, 2024)
- Information relating to local health priorities contained in LPA Health and Wellbeing Strategies and Joint Strategic Needs Assessments as set out in Table 10.1.
- Norfolk Core20 (Norfolk County Council, 2020a)
- Norfolk Insight (Norfolk County Council, 2020b)
- The State of Suffolk (updated for 2022) (Suffolk County Council, 2023)

- Baseline data presented in Chapter 6: Agriculture and Soils (document reference 6.6), Chapter 7: Air Quality (document reference 6.7), Chapter 9: Contaminated Land, Geology and Hydrogeology (document reference 6.9), Chapter 12: Hydrology, Land Drainage and Flood Risk (document reference 6.12), Chapter 13: Landscape and Visual (document reference 6.13), Chapter 14: Noise and Vibration (document reference 6.14), Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15), and Chapter 16: Traffic and Transport (document reference 6.16)
- Results from the PRoW surveys commissioned by the Project.

Study Area

10.4.4 In the absence of any standard guidance, study areas for the Health and Wellbeing assessment have been defined using professional judgement and experience of other similar linear projects. A Wider Study Area has been defined by the boundaries of the LPAs in which the Project is located, namely:

- South Norfolk Council
- Breckland District Council
- Mid Suffolk District Council
- Babergh District Council
- Colchester City Council
- Tendring District Council
- Braintree District Council
- Chelmsford City Council
- Brentwood District Council
- Basildon Borough Council
- Thurrock Council.

10.4.5 In order to provide a more detailed basis for assessment, a Local Study Area has also been identified which comprises wards that intersect with the Order Limits. These are listed in Table 10.3.

Table 10.3 Local Study Area – Wards intersecting the Order Limits

Local Planning Authority	Wards Intersecting the Order Limits
South Norfolk	Bressingham and Burston, Newton Flotman, Bunwell, Diss and Roydon, Forncett, Mulbarton and Stoke Holy Cross
Mid Suffolk	Bacton, Blakenham, Bramford, Battisford and Ringshall, Gislingham, Haughley, Stowupland and Wetherden, Mendlesham, Needham Market, Palgrave, Stonham
Babergh	Brett Vale, Bures St Mary and Nayland, Capel St Mary, Copdock and Washbrook, East Bergholt, Hadleigh North, Hadleigh South, South East Cosford, Sproughton and Pinewood

Local Planning Authority	Wards Intersecting the Order Limits
Tendring	Ardleigh and Little Bromley, Lawford, Manningtree and Mistley
Colchester	Lexden and Braiswick, Marks Tey and Layer, Rural North
Braintree	Coggeshall, Hatfield Peverel and Terling, Kelvedon and Feering, Silver End and Cressing, Witham North
Chelmsford	Boreham and The Leighs, Broomfield and The Walthams, Chelmsford Rural West, South Hanningfield, Stock and Margaretting, Writtle
Basildon	Billericay West, Burstead, Laindon Park, Langdon Hills
Brentwood	Herongate, Ingrave and West Horndon, Hutton East, Ingatestone, Fryerning and Mountnessing
Thurrock	Orsett, Chadwell St Mary, Little Thurrock Blackshots, Stanford-le-Hope West, East Tilbury

10.4.6 The Health and Wellbeing Study Areas are shown on Figure 10.1: Health and Wellbeing Study Areas (document reference 6.10.F1).

10.4.7 It is noted that the Study Areas for the assessment of potential Health and Wellbeing effects associated with the wider determinants of health may vary by the type of impact being assessed. For example, the Study Area for assessment of construction noise impacts may be more localised, compared to the Study Area for employment. Accordingly, the Health and Wellbeing assessment also takes account of the Study Areas of related topics that may affect environmental change, notably Chapter 6: Agriculture and Soils (document reference 6.6), Chapter 7: Air Quality (document reference 6.7), Chapter 13: Landscape and Visual (document reference 6.13), Chapter 14: Noise and Vibration (document reference 6.14), Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15), and Chapter 16: Traffic and Transport (document reference 6.16).

Site Survey

10.4.8 No site surveys have been undertaken specifically for the Health and Wellbeing assessment. However, the assessment has referenced survey results from other relevant environmental topics. For example, the PRoW surveys detailed in Appendix 16.2: Traffic and Transport Baseline Conditions (document reference 6.16.A2) have been used to identify how frequently these routes are used. This information can be used to determine how levels of physical activity and social connectedness may be impacted by the construction and operation (and maintenance) phases of the Project.

Assessment Methodology

10.4.9 This section sets out the methodology used for assessing the effects on Health and Wellbeing for those aspects scoped into the assessment, as set out within the EIA Scoping Report (document reference 6.19) and agreed in the EIA Scoping Opinion (document reference 6.20) and any additional aspects agreed to be assessed with

stakeholders. The scope of the Health and Wellbeing assessment is provided in Appendix 5.2: Scope of the Assessment (document reference 6.5.A2).

Defining Health and Wellbeing

10.4.10 The WHO defines health as a '*state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*' (WHO, 1948). The range of personal, social, economic and environmental factors that influence health status are known as health determinants and include the physical environment, income levels, employment, education, social support and housing.

10.4.11 Vulnerable populations are groups of people within society who may be sensitive to changes in health determinants and may include, for example, children, older people (age 65+), disabled people, and people in low-income households. Protected characteristics defined within the Equality Act 2010 are also usually considered as vulnerable for the purpose of Health and Wellbeing assessments.

10.4.12 The WHO states that '*there is no health without mental health*' (WHO, 2005). Mental wellbeing is defined as '*a dynamic state, in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society*' (Foresight, 2008). Mental disorders are characterised by a clinically significant disturbance in an individual's cognition, emotional regulation, or behaviour (WHO, 2022).

Approach to Assessment

10.4.13 Health effects are considered at a population, rather than an individual level. Effects are therefore presented in relation to the general population and the distribution of those effects within the population, paying particular attention to vulnerable groups.

10.4.14 Ascertaining the level of exposure of a population to effects on certain health determinants is based on professional judgement, considering inherent uncertainties in identifying how and where people may spend their time (for example in a location exposed to effects) as opposed to other locations where other factors may be responsible for health changes.

10.4.15 The assessment in this chapter assumes that all mitigation - embedded (design measures), standard, and any additional mitigation measures where required (as defined in Chapter 4: Project Description (document reference 6.4)) - are in place before assessing the effects. This is in accordance with guidance from IEMA as part of preparing a proportional assessment (IEMA, 2022a) and the EIA Scoping Report (document reference 6.19).

Health Determinants

10.4.16 Health is influenced by many factors, known as ‘health determinants’, which can be environmental, social, or economic in character. This assessment considers how the Project is likely to result in changes to health determinants, both during the construction and operation (and maintenance) phases, and how these changes may affect the health and wellbeing of the population. Table 10.4 sets out which health determinants have been assessed for both the construction and operation (and maintenance) phases. This is based on an understanding of the Project and likely nature of effects, whether a pathway exists between the health determinant and the population, and likely receptors present. The focus of the Health and Wellbeing assessment on wider health determinants has been informed through engagement with stakeholders and consultation responses received.

Table 10.4 Health determinants assessed

Determinant of Health*	Assessed for Construction?	Assessed for Operation (and Maintenance)?	Justification
Air quality	✓	x	During construction there is potential for air quality impacts to arise from construction dust, construction traffic and construction generators. The operation (and maintenance) phase would not give rise to any likely significant air quality impacts.
Noise	✓	✓	Construction activities have the potential to cause noise and vibration (e.g. from construction traffic, piling, general construction activity). During operation (and maintenance) there is a potential risk of noise from the East Anglia Connection Node (EACN) and Tilbury North Substations.,. Increases in noise can lead to impacts on mental and physical health (e.g. cardiovascular disease, sleep disturbance, stress, high blood pressure)
Visual amenity	✓	✓	Community mental health and wellbeing can be impacted by changes to landscapes and views that exist. During construction this is likely to be as a result of the presence of construction plant, and vegetation / site clearance. During operation (and maintenance) impacts may arise due to changes the Project would bring to the landscape/ townscape.
Community safety (traffic)	✓	x	During construction there would be an increase in traffic on the local road network which could increase risk to community users of the roads and pedestrian routes throughout the Study Area. During operation (and maintenance) there would be very little associated traffic.
Electric and magnetic fields (EMF)	x	x	There are no construction impacts associated with EMFs. In relation to the operation (and maintenance), the Project would be designed in accordance with Government guidance and precautionary policies relating to EMFs as set out in the EMF Compliance Report (document reference 7.8). A summary of this document is presented in Section 10.7 of this chapter as part of the assessment of perception of health risk arising from EMFs.

Determinant of Health*	Assessed for Construction?	Assessed for Operation (and Maintenance)?	Justification
Perception of health risk from EMF	x	✓	There are no construction impacts associated with EMFs. During the operation (and maintenance) phase there is the potential for anxiety and stress within the local population to arise as a result of perceptions about potential health effects caused by EMFs. The impacts on mental health and wellbeing arising specifically from local concerns about EMFs are therefore considered in the operation (and maintenance) assessment.
Access to social infrastructure (e.g. healthcare)	✓	x	During the construction phase there would be minimal impacts on social infrastructure from temporary land take; however, access to social infrastructure may be affected as a result of road/route diversions and traffic delays. A further area of impact may relate to the presence of the construction workforce and the associated impacts this might have on, for example, healthcare facilities. During the operation (and maintenance) phase there would be no impacts on access to social infrastructure.
Access to employment and training	✓	x	Construction of the Project would generate employment and training opportunities which may benefit the local population. Due to the nature of the Project, during operation (and maintenance) there would be minimal employment opportunities.
Physical activity (PRoW/ open space)	✓	x	During construction there would be disruption to recreational routes or areas of open space which may affect opportunities for physical activity. During the operation (and maintenance) phase, access to recreational routes would be reinstated and no effects are anticipated in relation to physical activity.
Food security	✓	x	During the construction phase there is the potential for a temporary loss of land used for agricultural purposes, which may have an associated impact upon food security. There are no anticipated effects in relation to food security during the operation (and maintenance) phase.

**also known as wider determinants of health*

Population Groups/ Receptors

10.4.17 The Health and Wellbeing assessment considers the impacts and subsequent effects of the Project on the health and wellbeing of the population affected by the Project as well as the distribution of those effects within the population. This means that the local resident population is the receptor for the assessment in addition to construction workers, pedestrians and cyclists, and vehicle and public transport users who are likely to experience changes in health determinants.

10.4.18 How impacts are experienced within a population can be influenced by factors such as age, gender, ethnicity and disability, which means that different groups of people are likely to be more (or less) sensitive to changes in health determinants resulting from the Project. These differences can lead to health inequality and social equity issues. It is therefore important to identify vulnerable populations who may be affected to a greater or lesser extent by changes in overall health determinants.

10.4.19 Table 10.5 sets out vulnerable groups within the population that are considered within the Health and Wellbeing assessment, the social receptor where this group is most likely to be present and the justification for why these groups have been identified. It should be noted that there is often intersectionality across groups, i.e. people are likely to experience more than one vulnerability at a time.

Table 10.5 Vulnerable groups considered in the assessment

Vulnerability	Vulnerable Group	Social Receptor	Justification
Age	Children and adolescents	Residential houses, open space, PRoW, schools and nurseries, community facilities, public transport routes / bus stops	Children and adolescents are more likely to be pedestrians and require freedom to move between their home, school, and recreational activities. They lack the experience and judgement of adults whilst interacting with traffic and public spaces. They are therefore more at risk from the dangers of motorised transport. Children are more sensitive than adults to air pollution, noise, odour, and other environmental factors, with their bodies less able to deal with them or inform them when something is wrong. Children living in deprived areas are particularly susceptible.
	Older people	Residential areas, retirement homes, healthcare facilities, open space, PRoW, public transport routes / bus stops, community facilities	As people age, movement and reactions generally become slower and impairments such as vision or hearing loss become more likely. They can be more at risk from injury and may be anxious about crossing the road safely or moving about their local area in general. This can lead to barriers to older people participating in outdoor activities, especially walking, which in turn can adversely affect health.

Vulnerability	Vulnerable Group	Social Receptor	Justification
			Older people are generally more reliant on health and social care services and other social infrastructure. They are less likely to drive and therefore more likely to be pedestrians or to use public transport. Therefore, this group is particularly vulnerable to changes relating to transport and access.
Income and social support	Low-income groups/ people without access to a car/ people who are unemployed or economically inactive	Residential areas, local businesses, open space, PRoW, public transport / bus stops, health and social care facilities, community facilities	People in low-income households generally experience worse health because they have fewer resources available to them to stay healthy. They may experience more stress as a result of the difficulties associated with low-incomes, which in turn impacts health and wellbeing. Employment is known to have a positive health benefit and therefore unemployed people are more likely to experience poor physical and mental health. This group are more likely to be reliant on services in their local area including local businesses (especially shops) and community facilities.
Health status	People with poor health status or who are disabled	Residential areas, healthcare facilities, open space, PRoW, public transport routes / bus stops, community facilities	Disabled people and those with poor health status are likely to be more vulnerable to changes in health determinants. For example, adverse changes in air quality are more likely to impact a person who is chronically ill with impaired lung function, or a person who has asthma. Noise can cause hypertension and cardiovascular problems and people who already have these conditions can be more impacted by adverse changes in noise levels. People with existing physical or mental poor health, including anxiety and depression, are likely to be more sensitive to changes in their local environment. Disabled people and those with poor health status are generally more reliant on social care services and other social infrastructure. They are less likely to drive and therefore more likely to be pedestrians or to use public transport services. Therefore, this group is vulnerable to changes relating to transport and access.

Mental Health and Wellbeing

10.4.20 Mental health issues are unevenly distributed across society, with disproportionate impacts on vulnerable populations, for example people living in poverty. In the same way that projects and plans can impact on the physical health of people and communities, they can also impact on mental health and wellbeing.

10.4.21 The assessment has taken into consideration guidance provided by the Mental Wellbeing Impact Assessment Toolkit (Cooke *et al*., 2011), as discussed and agreed with stakeholders. The Toolkit uses a four-factor framework for assessment and notes that changes within the local area (for example in traffic, noise, vibration, air quality, land conditions, hydrology and landscape) could alter feelings of control over the physical environment. This may include reduced feelings of attachment to, and pride in, a place and reduced enjoyment of outside space. The perception of health risks could also influence feelings of resilience. In this way the Project could affect the mental health of general and/or vulnerable populations. Mental health and wellbeing effects have been identified and assessed as appropriate within each of the individual topic assessments (focusing on wider health determinants as outlined in Table 10.4). The MWIA Toolkit is based on four protective factors:

- Enhancing control: incorporating a 'neighbourhood quality' approach to assessment. This refers to the physical environment in which people live their day to day lives, which is influenced by visual amenity, air quality, traffic (including Heavy Goods Vehicle (HGV) movements) and noise. The assessment focuses on qualitative change in the amenity and character of neighbourhoods, including combinations of impacts from a range of environmental factors which may alter people's levels of satisfaction with their living environment
- Increasing resilience: under this protective factor, the assessment considers the perceptions and community concerns relating to potential impacts associated with EMFs during the operation (and maintenance) phase and identifies approaches that could be taken to improve awareness and understanding
- Facilitating participation: the extent to which people are involved and engaged in activities outside their immediate household
- Promoting social inclusion: the extent to which people are able to access a variety of opportunities, for example employment, education or leisure.

Assessment of Effect

10.4.22 This Health and Wellbeing assessment has been prepared in accordance with IEMA guidance (IEMA, 2022a and 2022b) which apply to both the construction and operation (and maintenance) phases of the Project. The key steps in determining the significance of an identified health and wellbeing impact are summarised as:

- Assess the sensitivity of the population to changes in health determinant. This includes sensitivity not only of the general population, but also sensitivity relating to vulnerable groups and also sensitivity at ward level. The latter is confined to those wards which intersect with the Order Limits and has been developed following baseline assessment, with findings set out in Section 10.5 of this chapter
- Assess the magnitude of impact. This requires information about the impact such as exposure, scale, frequency, duration and population extent

- Consideration of population sensitivity to change alongside magnitude to determine significance of impact.

Health Sensitivity

10.4.23 The proposed approach to defining health sensitivity has been developed using professional judgement and following engagement with relevant stakeholders and is based on experience of other linear infrastructure projects (for example most recently, the Lower Thames Crossing project). Sensitivity criteria are taken from IEMA guidance (IEMA, 2022a) and presented in Table 10.6.

Table 10.6 Approach to defining sensitivity

Category/ Level	Indicative Criteria[3]
High	High levels of deprivation (including pockets of deprivation at ward level, for example); reliance on resources (for example the road network, or community assets) shared between the population and the Project; 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 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.

[3] Judgement based on most relevant criteria; some criteria span categories

Impact Magnitude

10.4.24 This is a qualitative assessment, determining the magnitude of potential change. The assessment takes into account:

- How the health determinant might change because of the Project and whether this would be beneficial or adverse
- Whether the duration of change would be temporary or permanent
- Exposure to change (including identification of particularly relevant vulnerable groups)
- Intensity of change (the magnitude or severity of the change in the health determinant).

10.4.25 The criteria for determining the magnitude of impact is informed by IEMA guidance (IEMA, 2022a) and is presented in Table 10.7.

Table 10.7 Health and Wellbeing magnitude criteria

Category/ Level	Indicative Criteria
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 (e.g. changes in the quality of services that support good health such as health services, schools, social care).
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 implications.

Significance

10.4.26 Identifying the significance of an effect requires consideration of both the sensitivity of the population to change together with the magnitude of the likely change. Table 10.8 sets out the descriptive significance criteria for health and wellbeing, whilst Table 10.9 summarises the significance matrix. It should be noted that where two values for significance are identified, professional judgement is made based on the most relevant criteria, and it is likely that in any given analysis some criteria will span categories.

Table 10.8 Health and Wellbeing significance criteria (IEMA, 2022a)

Category/ Level	Indicative Criteria
Major (significant)	• Changes, due to the Project, 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 engagement themes emerging from stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect • Changes, due to the Project, 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, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the Project and changes to health outcomes.
Moderate (significant)	• Changes, due to the Project, 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 • Changes, due to the Project, 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, including as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the Project and changes to health outcomes.
Minor (not significant)	• Changes, due to the Project, 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 • Changes, due to the Project, 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, including as evidenced by the effect size and/or scientific literature showing there is only a suggestive relationship between changes that would result from the Project and changes to health outcomes.
Negligible (not significant)	• Changes, due to the Project, 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 Project having no responses on this issue among stakeholders • Changes, due to the Project, 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, including as evidenced by the effect size and/or scientific literature showing there is an unsupported relationship between changes that would result from the Project and changes to health outcomes

Table 10.9 Health and Wellbeing significance matrix (IEMA, 2022a)

		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

10.4.27 Generally, major and moderate effects are considered to be significant, while minor and negligible effects are considered to be not significant. However, professional judgement has also been applied where necessary.

Limitations of Assessment

10.4.28 The following limitations have been identified for the Health and Wellbeing assessment:

- Health effects are considered at a population, rather than an individual level. Effects may therefore be presented in relation to the general population, in relation to vulnerable groups, or at ward level where relevant for particular effects
- The assessment has relied on third party, publicly available health data for the baseline and no surveys have been carried out. This approach is considered appropriate for the nature of the Project and robust
- Health assessments are by their nature predominantly qualitative and are based on guidance and professional judgement used to interpret the assessment outcomes. Evidence from literature, accepted and adopted by the public health profession is used in this process and is considered good practice
- Ascertaining the level of exposure of a population to effects on certain health determinants is based on professional judgement, considering inherent uncertainties in identifying how and where people may spend their time (for example in a location exposed to effects) as opposed to other locations where other factors may be responsible for health changes. The assessment draws from and builds upon the outputs of the supporting technical disciplines and is therefore subject to the same limitations and assumptions affecting those assessments
- The assessment of effects on mental health and wellbeing is an area which can be difficult to assess in a meaningful way due to data limitations and the relatively subjective nature of assessment. The MWIA has been used as a framework to guide the assessment and ensure it is robust
- It is acknowledged that not all uncertainty can be removed from the Health and Wellbeing assessment due to the limitations described above. However, the approach to assessment is considered robust due to the understanding of baseline conditions, LPA health priorities, use of a robust framework for assessment and engagement with health stakeholders.

Key Parameters for Assessment and Assumptions

10.4.29 This section describes the key parameters and assumptions that have been used / made when undertaking the assessment presented within this chapter. This chapter is based on the same assumptions as that of environmental topic chapters, in addition to the assessment outcomes of those assessments, notably:

- Chapter 6: Agriculture and Soils (document reference 6.6)
- Chapter 7: Air Quality (document reference 6.7)
- Chapter 13: Landscape and Visual (document reference 6.13)
- Chapter 14: Noise and Vibration (document reference 6.14)
- Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15)
- Chapter 16: Traffic and Transport (document reference 6.16).

10.4.30 As such, the key parameters and assumptions that have been used / assumed when undertaking the Health and Wellbeing assessment are aligned with those set out in the corresponding 'key parameters for assessment and assumptions' sections of each of the above chapters.

10.5 Baseline Conditions

Existing Baseline

10.5.1 Baseline conditions have been gathered from desk-based information (see Section 10.4) and presented with reference to the relevant section of the Project within which they are located.

10.5.2 The baseline for health and wellbeing comprises information about the health characteristics of the local area, covering both physical and mental health, as well as information that can be used to identify potential vulnerable populations (age, ethnicity, economic status, disability, sex/gender). When combined with environmental information, this provides the context necessary to assess the potential effects of the Project on Health and Wellbeing.

10.5.3 A summary of baseline conditions is presented in this chapter, with further detail presented in Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1) and shown on Figures 10.1 to 10.14 (document reference 6.10.F1 to 6.10.F14). Relevant health and wellbeing receptors (for example community, health and education facilities, areas of green space) are shown on Figure 10.2: Health and Wellbeing Receptors (document reference 6.10.F2).

Population

10.5.4 Detailed information relating to population size, population growth between 2011 and 2021 and age profile can be found in Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15). In summary, South Norfolk and Thurrock have experienced the most significant growth in population between the two Census periods (2011 and 2021), with a 14.4% and 11.6% increase, compared with 11.6% for Thurrock. Thurrock also saw a considerable rise, with an 11.6% increase. Colchester and Norwich followed with increases of 11.3% and 8.9% respectively.

LPAs including Babergh, Mid Suffolk, and Braintree saw more moderate increases between the two Census periods, ranging from 4.4% to 7.3%. The data shows an overall upward trend in population across the Wider Study Area.

10.5.5 Population density is generally low, reflecting the predominantly rural nature of the Local Study Area. This is shown on Figure 10.9: Population density of the Study Area (document reference 6.10.F9). South Norfolk has a generally low population density, with only Diss and Roydon exceeding the England average. Similarly, in Babergh, Tendring, Colchester, Braintree and Brentwood, only one ward per LPA area exceeds the England average. Every ward in Basildon and all but one ward in Thurrock has a population density greater than the England average, with Little Thurrock Blackshots in Thurrock having the highest density of the Local Study Area.

10.5.6 Data relating to gender is shown in Figure 10.4: Percentage of the Study Area identifying as female (document reference 6.10.F4).

Ethnicity

10.5.7 The Local Study Area is less ethnically diverse than England as a whole, with Thurrock (Section H) showing the greatest diversity, and having the only ward (Little Thurrock Blackshots) which is more ethnically diverse than England. Whilst not as diverse as wards in Thurrock, Battisford and Ringshall (Mid Suffolk, Section B), Broomfield and The Walthams (Chelmsford, Section F), Laindon Park and Langdon Hills (Basildon, Section G), Hutton East (Brentwood, Section G) and Stanford-le-Hope West and East Tilbury (Thurrock, Section H) show greater levels of ethnic diversity than is the case for the rest of the Local Study Area (OHID, 2022). Levels of ethnic diversity across the Local Study Area are shown on Figure 10.5: Percentage of the Study Area identifying as non-white, including Asian, black, mixed ethnic and other ethnicities (document reference 6.10.F5), with Figure 10.6: Percentage of the Study Area with English as their main language (document reference 6.10.F6) showing proportions of residents within the Local Study Area for whom English is their main language.

10.5.8 Further detail regarding ethnicity is provided in Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1).

Deprivation

10.5.9 Deprivation levels across the Local Study Area are shown in Figure 10.3: Indices of Multiple Deprivation Score (document reference 6.10.F3). Generally, the Local Study Area shows a lower level of deprivation when compared to England as whole. Tendring (Section C) has the highest level of income deprivation and child poverty within the Local Study Area. Only one ward within the Local Study Area, Laindon Park in Basildon (Section G) performs worse than the England average in relation to the Index of Multiple Deprivation (2019) (MHCLG, 2019).

10.5.10 With the exception of Brentwood (Section G), all the LPAs within the Wider Study Area have a higher-than-average rate of fuel poverty. In Tendring (Section C), 16.5% of houses are classified as in fuel poverty, the highest within the Wider Study Area (OHID, 2022).

Economy

10.5.11 In terms of economic activity, all wards in Thurrock (Section H) have higher levels of economic activity than the England average, whereas all wards in South Norfolk (Section A) and the north of Mid Suffolk have less economically active populations. This is likely to be reflective of the ageing population in these areas and the number of retired residents specifically. Levels of economic activity across the Local Study Area are shown on Figure 10.7: Percentage of the Study Area economically active (document reference 6.10.F7).

10.5.12 All the LPAs in the Wider Study Area have a lower rate of unemployment than England as a whole, with the exception of Tendring (which is roughly equal to that for England) and Thurrock (which is higher). In Basildon (Section G), however, 'long-term unemployment'[4] is higher compared to England as a whole. This indicates that those out of work in Basildon are unemployed for an extended period and may find it harder to return to employment.

10.5.13 Educational attainment across the Local Study Area varies. Wards where a high proportion of the population have no qualifications include Little Thurrock Blackshots (Thurrock) (21.6%), Laindon Park (Basildon) (23.6%) and Diss and Roydon (South Norfolk) (24.4%), compared to the England average of 18.1%. Wards with a correspondingly high proportion of the population who have achieved a Level 4 qualification (university degree or equivalent) or above include Lexden and Braiswick (Colchester) (38.7%) (compared to 33.9% for England as a whole). Levels of educational attainment across the Local Study Area are shown on Figure 10.8: Percentage of the Study Area with a qualification of Level 2 or lower (document reference 6.10.F8).

Physical Health

10.5.14 Health indicators across the Local Study Area show a varied composition in comparison to the national context. Two wards in Mid Suffolk (Needham Market and Bramford) (Section B) and one ward in Tendring (Lawford, Manningtree and Mistley) (Section C) have the highest proportions of disabled people, as defined under the Equality Act 2010. This information is shown on Figure 10.10: Percentage of the Study Area considered disabled under the Equality Act (document reference 6.10.F10). This could be reflective of the ageing population in these areas when compared to other LPAs in the Wider Study Area. South Norfolk (Section A) additionally has one of the highest life expectancies in the Wider Study Area, with Tendring (Section C) having the lowest for both males and females (Norfolk County Council, 2020a).

10.5.15 Information relating to adult and child obesity is shown on Figure 10.11: Adult prevalence of overweight (including obesity) in the Study Area (document reference 6.10.F11) and Figure 10.12: Year 6 prevalence of overweight (including obesity) in the Study Area (document reference 6.10.F12). Across the Local Study Area, there is generally a similar or lower rate of childhood obesity when compared to England as a whole. By Year 6, all the LPAs record childhood obesity rates in line with or lower than the average for England (OHID, 2022; Essex County Council, 2019). Wards with the highest incidence of childhood obesity include Bunwell (South Norfolk, Section A), Witham North (Braintree, Section E) and East Tilbury (Thurrock, Section G). Childhood obesity indicates that opportunities for exercise, active travel, outdoor recreation and accessing healthy food is a challenge during childhood.

[4] Long-term unemployment is most generally defined as being out of work for 12 months or more.

10.5.16 The percentage of physically inactive adults within the Wider Study Area is generally in line with the England average. Tendring (Section C) and Thurrock (Section H) have the lowest proportions of active adults. Working to reduce excess weight and obesity across all age groups is highlighted as a key priority within the Essex JSNA. Childhood obesity and adult activity levels are identified as areas of focus within the Suffolk Health and Wellbeing Strategy (Suffolk County Council, 2023).

10.5.17 The proportion of the population of the Wider Study Area within a 10-minute walk of green and blue infrastructure varies, as shown on Figure 10.13: Population within a 10 minute walk of green or blue space (document reference 6.10.F13). Mid Suffolk and Brentwood have the lowest proportions of residents within a 10-minute walk. Basildon and Chelmsford both have the highest proportions of residents within a 10-minute walk and exceed the England average. Mental health benefits of spending time in nature can improve creative development and improve stress levels, which can have further reductions in physical health problems, such as reducing blood pressure.

10.5.18 Across the Wider Study Area, the Lower Super Output Areas (LSOAs)[5] ranked as the most deprived according to the health deprivation and disability domain are primarily focused in urban areas, with the highest number of LSOAs in the top 10% in Tendring (Section C). Variations by ward within the Local Study Area are also evident.

10.5.19 Prior to the COVID-19 pandemic, life expectancy, healthy life expectancy, and disability-free life expectancy for both men and women were higher in Essex than was the case for England as a whole. Below the county level however, the picture of life expectancy is much more varied. For example, in Essex there is a gap of around 12 years in life expectancy between those living in the most and least deprived neighbourhoods. Essex County Council has identified this as a potential focus area (Essex County Council, 2019). Similarly, this is a priority for Suffolk County Council (Suffolk County Council, 2023).

Mental Health and Wellbeing

10.5.20 The Government published Health Matters: Reducing Health Inequalities in Mental Illness in 2018 (Public Health England, 2018), which highlighted that people with severe and enduring mental illness are at greater risk of poor physical health and reduced life expectancy compared to the general population. The report notes that mental health problems can affect anyone and have significant effects on wider society. There are a wide range of mental health conditions and disorders, with common mental health conditions such as depression and anxiety affecting one in five of the population. Issues of mental wellbeing, mental illness and mental distress are all interlinked, and there is a clear link between loneliness and poor mental and physical health.

10.5.21 The ONS released annual estimates of personal wellbeing following the COVID-19 pandemic. Each of the scores are average ratings out of ten, with participants asked to mark their feelings of anxiety, happiness, life satisfaction and worthwhile measure ('feeling that the things done in life are worthwhile'). The happiness measure, across the Wider Study Area, is generally in line with or higher than the England average,

[5] LSOAs are made up of groups of Output Areas (which are smaller areas the census uses and are based on postcodes - they are used for statistical purposes), usually four or five. They comprise between 400 and 1,200 households and have a usually resident population between 1,000 and 3,000 persons (Census 2021).

with the exception of Colchester City Council, which falls 0.8 below the England average. On the life satisfaction measure, the LPA areas of Tendring, Braintree and Basildon rank the lowest, falling below the England average.

10.5.22 Mental health and wellbeing is a priority identified in the majority of the JSNAs and Health and Wellbeing Strategies of LPAs within the Wider Study Area. For example, the Essex JSNA identifies mental health and wellbeing as a priority for the county, with a primary focus for areas including Basildon (Section G), Colchester (Sections C and D) and Tendring (Section C). Worsening mental health has been highlighted in areas including Tendring and Colchester, where there are higher hospital admissions for self-harm and lower scores for life satisfaction and happiness.

10.5.23 Crime rates for public order offences are generally low throughout the Wider Study Area. LPAs with the highest rates of offences relating to incivilities are Tendring, Colchester and Basildon, which could contribute to poor mental health through fear and stress. Crime rate data for the Wider Study Area is shown on Figure 10.14: Crime rate for public order crimes per 1,000 (document reference 6.10.F14).

Wider Environmental Baseline

10.5.24 Baseline information is also relevant in relation to wider determinants of health (for example air quality management areas, noise important areas, community infrastructure, landscape character types, location of PRoWs, cycle routes and bridleways). Further baseline information is provided within relevant ES Chapters as follows:

- Chapter 7: Air Quality (document reference 6.7)
- Chapter 13: Landscape and Visual (document reference 6.13)
- Chapter 14: Noise and Vibration (document reference 6.14)
- Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15)
- Chapter 16: Traffic and Transport (document reference 6.16).

Sensitivity Profile of Wards Intersecting the Order Limits

10.5.25 Baseline data has been used to inform the sensitivity to change of communities living in those wards which intersect with the Order Limits. A series of health-related indicators has been reviewed for individual wards, namely:

- Index of Multiple Deprivation score
- Percentage of community with increased susceptibility to health issues (people aged 65+)
- Percentage of children (aged <16 years)
- General health – percentage of residents who report ‘bad health’ or ‘very bad health’
- People who are disabled under the Equality Act 2010
- Life expectancy – male
- Life expectancy – female
- Deaths from all causes, all ages (Standardised Mortality Ratio)
- Year 6 prevalence of obesity in children (%).

10.5.26 For each of the above indicators, data has been compared against that for England as a whole. Data for each ward is presented in Appendix 10.1: Health and Wellbeing Baseline Statistics (document reference 6.10.A1). This information has been reviewed alongside the assessment criteria set out in Table 10.6 (which takes account of the multiple health determinants affecting one community), together with professional judgement, in order to inform the assessment of sensitivity for each ward, which is summarised in Table 10.10.

Table 10.10 Sensitivity assessment of wards intersecting the Order Limits (Local Study Area)

Sensitivity	Wards (Local Study Area)
High	**South Norfolk:** Bressingham and Burston, Newton Flotman **Mid Suffolk:** Bacton, Bramford **Babergh:** Hadleigh North **Braintree:** Hatfield Peverel and Terling, Witham North **Basildon:** Laindon Park **Thurrock:** Chadwell St Mary
Medium	**South Norfolk:** Bunwell, Diss and Roydon, Forncett, Mulbarton and Stoke Holy Cross **Mid Suffolk:** Battisford and Ringshall, Gislingham, Haughley, Stowupland and Wetherden, Mendlesham, Needham Market, Palgrave, Rickinghall, Stonham **Babergh:** Brett Vale, Bures St Mary and Nayland, Copdock and Washbrook, Hadleigh South **Tendring:** Lawford, Manningtree and Mistley **Braintree:** Kelvedon and Feering, Silver End and Cressing **Chelmsford:** Broomfield and The Walthams, Writtle **Brentwood:** Herongate, Ingrave and West Horndon, Hutton East **Thurrock:** Orsett, Little Thurrock Blackshots, Stanford-le-Hope West, East Tilbury
Low	**Mid Suffolk:** Blakenham **Babergh:** Capel St Mary, East Bergholt, Sproughton and Pinewood **Tendring:** Ardleigh and Little Bromley **Colchester:** Lexden and Braiswick, Marks Tey and Layer, Rural North **Braintree:** Coggeshall **Chelmsford:** Boreham and The Leighs, Chelmsford Rural West, South Hanningfield, Stock and Margaretting **Basildon:** Billericay West, Burstead, Langdon Hills **Brentwood:** Ingatestone, Fryerning and Mountnessing

Future Baseline

10.5.27 The future baseline relates to known or anticipated changes to the current baseline in the future which should be assessed as part of the Project within the ES (Volume 6 of the DCO application).

10.5.28 The ONS produces 25-year subnational projections for population, which represent an indication of future trends. The projections are based on trends from the previous five years with regards to changes in age and sex. The latest projections are based on data from 2021.

10.5.29 Table 10.11 shows a varied pattern across the Wider Study Area, with some LPAs showing greater and lower proportions of each future age group when compared to the national average for England. All the LPA populations are expected to increase through to 2043.

Table 10.11 2043 population forecast by Local Planning Authority area

	Population Aged Under 5 Years (%)	Population Aged 5 to 15 Years (%)	Population Aged 16 to 24 Years (%)	Population Aged 25 to 64 Years (%)	Population Aged 65 Years and Over (%)	Total Population (2043)
South Norfolk (Section A)	5	11	8	47	29	177,110
Mid Suffolk (Section B)	4	9	8	46	32	115,846
Babergh (Section C)	4	10	8	44	34	101,923
Colchester (Section C and D)	6	11	14	49	20	228,062
Tendring (Section C)	5	10	9	42	35	175,427
Braintree (Section E)	6	12	11	51	20	162,144
Chelmsford (Section F)	5	11	10	50	23	204,078
Brentwood (Section G)	6	11	10	50	24	78,573
Basildon (Section G)	6	12	11	51	20	206,509
Thurrock (Section H)	7	13	11	52	17	205,470
England	5	11	11	49	24	61,744,000

Source: ONS, 2021

10.5.30 Period life expectancy at birth in the UK is projected to increase between 2022 and 2047, to 82.1 years for males and 85.7 years for females, although rises are lower than previously predicted (ONS, 2025). Predicting future life expectancy is uncertain as it may be impacted by a variety of factors, including changes in the prevalence of

chronic conditions, changes in living standards and wider socio-economic characteristics.

10.5.31 Local planning policy across the Study Area aims to improve the health of the population while improving quality of life. The JSNAs prepared for individual LPAs emphasise improving mental and physical health, addressing the need to reduce childhood and adulthood obesity rates and increase physical activity rates.

10.5.32 A widening of inequality between the most and least deprived areas in recent years suggests that health inequalities may also continue to widen. This in turn may result in adverse effects on the wellbeing of the population and increased pressure on healthcare services.

10.6 Proposed Mitigation

10.6.1 The approach to mitigation including a description of the mitigation hierarchy is set out in Chapter 5: EIA Approach and Method (document reference 6.5). Three types of mitigation have been incorporated into the Project and assessment: embedded, standard and additional environmental mitigation.

Embedded Mitigation

10.6.2 Environmental appraisal has been an integral part of the Project design from the outset, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable.

10.6.3 National Grid has also embedded measures into the design of the Project to avoid or reduce significant effects that may otherwise be experienced during construction and operation (and maintenance) of the Project.

10.6.4 Embedded measures are those that are intrinsic to and built into the design of the Project, which are presented in Table 4.2 of Chapter 4: Project Description (document reference 6.4). Embedded measures relevant to Health and Wellbeing include:

- Sensitive routeing and siting to avoid and reduce as far as practicable effects on identified environmental and socio-economic receptors. The Project has avoided where possible sensitive features such as centres of population and community, healthcare, and education facilities, through the corridor and routeing studies. Where practical, temporary construction compounds would be located to avoid or minimise environmental and community effects, provide the best access for personnel and deliveries in relation to major structures and worksites, and meet other construction requirements for the Project
- The Project has been designed in accordance with National Grid design standards and complies with the guidelines and policies relating to EMF as stated in NPS EN-5 (DESNZ, 2024b), including the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines (ICNIRP, 1998). Compliance with these guidelines and policies mean that the Project will already have designed out potential effects from EMF to a level appropriate to meet health and safety standards, including precautionary measures
- The Project has been designed to comply with design safety standards including the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS) and the suite of National Grid policies and processes which contain details on design standards required to be met when designing,

constructing, and operating its projects. Existing National Grid processes are designed to identify potential safety risks during construction and operation (and maintenance) and to design these out at each stage of Project development

- Temporary Non-Motorised User (NMU) routes are proposed at two locations in order to mitigate impacts arising from the expected increase in construction traffic. The NMU routes along Bentley Road and Ardleigh Road in Essex and Hoford Road in Thurrock would comprise an off-road path to separate vulnerable users from the construction traffic
- The Project includes the rationalisation of existing electricity transmission infrastructure, with several existing overhead and underground third-party services requiring diversion, removal, undergrounding, or other protection to facilitate the Project.

Standard Mitigation

10.6.5 Standard mitigation measures, comprising management activities and techniques, would be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.

10.6.6 The Outline CoCP (document reference 7.2) contains standard mitigation measures of relevance to Health and Wellbeing. Note that measures have been assigned references (for example GG01). For ease of cross-reference, these align with the references provided in Table 6.1 of the Outline CoCP (document reference 7.2). These measures include but are not limited to:

- GG05: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project
- GG17: Any activity carried out or equipment located within a temporary construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration, and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where reasonably practicable (see Appendix B: Site Waste Management Plan, Appendix D: Dust Management Plan and Appendix F: Noise and Vibration Management Plan of the Outline CoCP (document reference 7.2) for further details)
- GG30: Members of the community, local businesses and local stakeholders will be kept informed regularly of the works through active community liaison. This will typically include the notification of ‘noisy activities’, heavy traffic periods and start and end dates of key phasing. A contact number will be provided which members of the public can use to raise any concerns or complaints about the Project. All construction-related complaints will be logged by the Main Works Contractor(s) in a complaints register, together with a record of the responses given and actions taken
- NV01: Main Works Contractor(s) will be required to follow good construction practices and best practicable means (BPM) as outlined in British Standard 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise (BS 5228-1) and Part 2: Vibration (BS 5228-2) for the control of noise and vibration, respectively. BS 5228-1 and BS 5228-2 have Approved Code of Practice status (in England) under the powers conferred by Sections 71(1)(b), (2) and (3) of the Control of Pollution Act 1974, as enacted under The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015

- S02: PRoWs crossing the working areas will be managed in discussion with the relevant Local Planning Authorities and potential temporary closures and diversions applied, where required. Road closures and diversions will be kept as brief as practicable, with alternative routes maintained where possible. Access disruption would be reduced while construction activities occur where practicable. Any required temporary diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns. Management of PRoW during construction is detailed in the Outline PRoW Management Plan (document reference 7.6).

10.6.7 Interactions with PRoWs would be managed in line with measures outlined in the Outline PRoW Management Plan (document reference 7.6) to manage potential effects on PRoWs and users of PRoWs.

10.6.8 The Outline CoCP (document reference 7.2) is secured by Requirement 4 in the draft DCO (document reference 3.1) which requires the Main Works Contractor(s) to prepare the CoCP to discharge the Requirement.

10.6.9 The Outline CTMP (document reference 7.3) details National Grid's proposals for minimising disruption from construction activities to existing users on the public highway network and properties adjacent to it. The Outline CTMP will be adopted by the Main Works Contractor(s) appointed and will inform the CTMP, a comprehensive and overarching management procedure which they will follow.

Additional Mitigation

10.6.10 Additional mitigation comprises measures over and above any embedded and standard mitigation measures to further reduce significant environmental effects.

10.6.11 No additional mitigation measures, beyond the embedded and standard measures identified above, are required.

10.7 Residual Effects

10.7.1 The likely significant effects of the Project have been assessed using current available data relating to both the construction and operation (and maintenance) phases of the Project. The residual effects are outlined below. As previously stated, this section assumes that all mitigation - embedded (design measures) and standard measures - are in place before assessing the effects. This is in accordance with guidance from IEMA as part of preparing a proportional assessment (IEMA, 2022a). No additional mitigation measures have been identified as required at this stage.

Construction

10.7.2 The Health and Wellbeing assessment has considered residual effects associated with changes to the following health determinants:

- Air quality
- Noise
- Landscape and townscape (visual amenity)
- Community safety (traffic)

- Access to social infrastructure (e.g. healthcare)
- Food security
- Access to jobs and training
- Physical activity (PRoW / open space)
- Mental health and wellbeing.

Air Quality

10.7.3 Potential impacts resulting from a change in air quality from construction activities (for example construction dust) have the potential to adversely impact the health of local residents.

Overview of Current Evidence and Impact Pathways

10.7.4 There is significant existing evidence to suggest that changes in air quality can have adverse effects on human health. Exposure to air pollutants such as particulate matter (PM) can cause penetration into the respiratory tract and lungs, leading to enhanced rates of pulmonary disease and other lung infections. $PM_{10-2.5}$ can similarly lead to inflammation of the lungs, exacerbating existing asthma conditions (Guarnieri and Balmes, 2014). Additionally, increases in concentrations of nitrous oxides and sulphur oxides has been found to increase rates of respiratory symptoms (van der Zee *et al.*, 2000). Chronic obstructive pulmonary disease (COPD) may be induced following air pollution, increasing morbidity and mortality. Multiple cardiovascular effects have been observed after exposure to air pollutants, with changes occurring in blood cells after long-term exposure affecting cardiac functionality (Manisalidis *et al.*, 2020). Aguilera *et al.* (2023) have similarly identified exposure to high levels of air pollutants as a risk factor for placental abruption, low birth weight, preterm birth, infant mortality and adverse lung and respiratory effects in pregnant women and babies.

10.7.5 Susceptible populations and vulnerable groups include children, older people, and those in low socio-economic households (Kurt *et al.*, 2016), or those with existing underlying health conditions.

10.7.6 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: construction dust from earthworks, construction and trackout, as well as the removal of existing infrastructure. Construction traffic can additionally lead to changes in air quality as a result of pollutants from exhaust emissions
- Pathway: both positive and negative health effects can be caused by changes in air quality
- Receptors: local communities, users of recreational routes, people living and working within the area. Vulnerable groups include children, older people and people in low-income households / areas of social deprivation.

Potential Impacts During Construction

10.7.7 Chapter 7: Air Quality (document reference 6.7) identifies the likely significant effects of construction dust associated with the construction phase of the Project. With the implementation of standard mitigation measures, the risk to human health arising

from construction dust would be low, resulting in a negligible and not significant effect. A range of methods to mitigate potential air quality effects have been proposed within the Outline CoCP (document reference 7.2), to be implemented in a proportionate manner.

10.7.8 Additionally, Chapter 7: Air Quality (document reference 6.7) models the effects of construction traffic on human receptors. Annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ are all predicted to return a negligible and not significant effect during the construction phase. The highest concentration of $PM_{2.5}$ experienced is predicted at receptor HR_38, a nursery school on Halstead Road, Colchester. However, concentrations modelled at this location were 7.6 µg/m^3, which falls below legal thresholds. Full results of the air quality assessment by individual receptor can be found in Appendix 7.3: Air Quality Assessment Results (document reference 6.7.A3).

10.7.9 The use of generators and non-road mobile machinery (NRMM) would be located away from sensitive receptors and the release height of any emissions would be adapted to ensure sufficient dispersion. Locations where compounds are within 100 m of sensitive receptors are shown in Table A7.3.11 in Appendix 7.3: Air Quality Assessment Results (document reference 6.7.A3). Chapter 7: Air Quality (document reference 6.7) concludes that use of construction NRMM is unlikely to result in significant effects on local air quality.

Likely Health Effects

10.7.10 The sensitivity of the general population to changes in health determinants is assessed as low due to predominantly fair health status being recorded and with only a small proportion of the population experiencing slight limitation in undertaking daily activities. The sensitivity of vulnerable population groups, with particular reference to pregnant women, children, older people, those with existing health conditions and those in low-income households, is assessed as high. Effects are limited to the construction phase of the Project, and any exposure would be small scale and short-term, with minor / negligible effects reported for construction dust, construction traffic and NRMM in Chapter 7: Air Quality (document reference 6.7).

10.7.11 The magnitude of effect on health is therefore described as **negligible**, resulting in a **negligible** and **not significant** effect on health for both general and vulnerable population groups across all wards.

Noise

10.7.12 Changes in noise levels resulting from the construction of the Project could have an adverse effect on health and wellbeing.

Overview of Current Evidence and Impact Pathways

10.7.13 Changes in noise level can potentially interfere in complex task performance, modify social behaviour and cause annoyance. Studies of occupational and environmental noise exposure suggest an association with hypertension; community studies show a weaker relationship between noise and cardiovascular disease (Stansfeld and Matheson, 2003). Noise-induced stress increases blood pressure and raises stress hormone levels, which can further increase incidence of cardiovascular effects (Münzel *et al.*, 2024).

10.7.14 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: changes in noise levels as a result of construction activities and traffic generation
- Pathway: disruption to people as a result of changes in noise levels
- Receptors: people living or working in the vicinity of the Project. Vulnerable groups may include children, older people (who may be more likely to experience hearing-related conditions), people with pre-existing physical and mental health conditions, people with newborn babies, shift workers and people in low-income households.

Potential Impacts During Construction

10.7.15 The construction noise assessment, as presented within Chapter 14: Noise and Vibration (document reference 6.14) identifies the potential for significant adverse effects during daytime, nighttime and weekend periods, associated with highways remediation and haul road works, cable and pylon construction, the construction of the temporary construction compounds and conductor stringing.

10.7.16 However, with the use of mitigation in the form of BPM, the magnitude of impact of construction noise is expected to be negligible to small at all nearby residential and low to medium sensitivity non-residential Noise Sensitive Receptors (NSRs), and negligible at all nearby high sensitivity NSRs across all periods assessed (i.e. daytime, nighttime and weekends).

10.7.17 There would also be noise generated by additional vehicle traffic (including heavy goods vehicles) on the local road network, travelling to and from the work sites. An assessment of potential noise impacts from construction traffic is presented in Appendix 14.2: Construction Traffic Noise Assessment (document reference 6.14.A2). The assessment indicates that construction traffic noise impacts are negligible or small (and therefore not significant) on most routes.

10.7.18 Chapter 14: Noise and Vibration (document reference 6.14) identifies the potential for a large (negative) magnitude impact along one route, Primary Access Route (PAR) 30, Bentley Road (located in Section C of the Project). One NSR (a residential property) is identified specifically as having a likely significant effect (without mitigation) due to the small distance between the property and the carriageway.

Likely Health Effects

10.7.19 The sensitivity of the general population to changes in noise level is considered to be low. The sensitivity of vulnerable groups (for example children, older people, people with pre-existing health conditions, shift workers and parents with newborn babies) is considered to be high.

10.7.20 Chapter 14: Noise and Vibration (document reference 6.14) identifies no significant effects in relation to construction noise as a result of construction activities. However, the chapter identifies a large (negative) magnitude impact for PAR 30 (Bentley Road) in relation to noise as a result of construction traffic. PAR 30 is located within Ardleigh and Little Bromley ward, which is considered to be of low sensitivity by virtue of its demographic profile. The section of Bentley Road which comprises PAR 30 passes through a predominantly rural area enabling access to a handful of properties. Only one significant effect has been identified in Chapter 14:

Noise and Vibration (document reference 6.14) at an NSR (a residential property) as a result of changes in construction traffic noise. From a health perspective, any health effect is likely to be experienced at individual rather than at population level. The magnitude of impact on health is therefore considered to be **negligible** with a resulting **negligible** and **not significant** effect across all wards for both general and vulnerable populations.

Landscape and townscape – Visual Amenity

10.7.21 Community mental health and wellbeing can be impacted by changes to landscapes and the views that exist. During construction this is likely to be as a result of the presence of construction plant, and vegetation / site clearance.

Overview of Current Evidence and Impact Pathways

10.7.22 Visual amenity plays a crucial role in shaping individuals' perceptions of their surroundings, influencing mental wellbeing, stress levels, and overall quality of life. Environments that are visually appealing, such as green spaces, clean streets, or well-designed urban areas, promote relaxation, reduce stress, and support positive mental health outcomes. Construction sites and areas often disrupt the aesthetic quality of an area, introducing noise, dust, and visual clutter, which can lead to increased stress, anxiety, and reduced mental wellbeing. Prolonged exposure to such environments may contribute to feelings of social disconnection and dissatisfaction with one's surroundings. UK-based studies, such as those by Mitchell and Popham (2008), highlight the importance of maintaining visual amenity to mitigate health inequalities and promote mental resilience. Research by McCarthy (2019) highlights how degraded environments can increase stress and discourage physical activity, amplifying risks of obesity and cardiovascular diseases.

10.7.23 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: changes in the character of the landscape / townscape as a result of the presence of construction plant or due to vegetation / site clearance
- Pathway: changes in the appearance of an area can impact people's mental health and wellbeing due to changes in the way they feel about an area or place
- Receptors: people living in proximity to the Project route or location of construction activities (for example temporary construction compounds) and who may directly experience changes in visual amenity.

Potential Impacts During Construction

10.7.24 Potential sources of visual amenity effects during construction range from the loss of landscape elements and features such as woodland, trees, scrub and hedgerows within the Order Limits due to site and vegetation clearance, through to earthworks activities associated with the creation of temporary construction compounds and site accesses, through to activities associated with construction plant and equipment, temporary scaffolding and construction lighting.

10.7.25 Appendix 13.3: Visual Baseline and Assessment (document reference 6.13.A3) provides an assessment of effects on visual receptors (people) across 80 Visual Receptor Areas (VRAs) along the Project. Community, recreation and road user receptors are identified relevant to each VRA (for example for VRA A1 Swardeston,

relevant receptors are described as: people living and moving around the settlements of Keswick, Lower East Carleton, Swardeston, the northern edge of Mulbarton and from scattered properties; people using the network of local PRoWs and open access land; horse riders using bridleways; and people travelling along the A47, A140, B1113 Main Road and the network of local lanes which cross the VRA).

10.7.26 Chapter 13: Landscape and Visual (document reference 6.13) states that significant adverse effects during construction are predicted for visual receptors within all of the VRAs that would be directly affected by construction activity within the Order Limits. These significant effects are related to the introduction of construction activity into close to medium distance views of residents, recreational receptors and road users.

10.7.27 For the majority of VRAs, effects are described as major (significant) for receptors within 0.5 km, reducing to moderate (significant) for receptors between 0.5 km and 1.5 km, and minor (not significant) for receptors beyond 1.5 km. There are several exceptions to this, where significant effects may be extended across all three distance categories, for example where there are open, elevated and/or wide views towards construction activity. These comprise the following VRAs:

- VRA A5 Talcolneston
- VRA B13 Somersham
- VRA C9 Stratford St Mary and Dedham
- VRA D2 Little Horkesley and Wormingford.

10.7.28 Relevant standard mitigation measures relating to Landscape and Visual effects are set out in the Outline CoCP (document reference 7.2), for example in relation to retention of sensitive features (such as veteran and mature trees, and ancient woodland); and maintaining elements in the landscape where practicable (such as vegetation and hedgerows).

Likely Health Effects

10.7.29 Members of the general population who are in good physical and mental health have a greater ability to respond to changes in their physical environment and as such the sensitivity of this group is considered to be low. The sensitivity of vulnerable groups to changes in visual amenity is high; vulnerable groups include people with existing poor mental health, people who may have a high degree of concern about the Project, people in low-income households who may have less ability or resources to adapt to change and people who are living in very close proximity to the Project where pylons and overhead lines are being erected as part of the construction process.

10.7.30 Residents living in closest proximity to construction activities, particularly where construction of the overhead line infrastructure itself is taking place (and therefore effects are of a more permanent duration) may be more vulnerable to change, particularly during the short-term and are therefore identified as being of high sensitivity. Significant visual effects are identified at 0.5 km distance for all VRAs during construction, with the exception of six VRAs where a construction assessment is not applicable as set out in Appendix 13.3: Visual Baseline and Assessment (document reference 6.13.A3).

10.7.31 The magnitude of effect for the general population and for vulnerable groups is considered to be **low**. This is because the duration of construction activities is likely to be short-term (over a period of four years, but intermittent) and changes to quality

of life are anticipated to be medium during the construction period. Impacts are likely to be experienced differentially by members of local communities according to factors such as where they live, or their outlook. Whilst there is scientific evidence that identifies a link between visual change and health outcomes, during construction this is not considered to result in extensive change and health deprived populations would not be disproportionately affected. Therefore, a **minor adverse (not significant)** health effect is anticipated as a result of changes in visual amenity during construction for the general population and vulnerable groups.

Community Safety (Traffic)

10.7.32 During the construction period there is the potential for an increase in traffic on the road network which could increase risk to users of the roads (including pedestrians and cyclists) within the Study Area.

Overview of Current Evidence and Impact Pathways

10.7.33 There is a significant causal relationship between higher levels of motorised transport and greater numbers of road casualties and deaths (Ward *et al*., 2007). The most vulnerable users, or groups with greater sensitivity, include children, older people and disabled people. The risk of being injured or killed in road traffic accidents is also proven to be greater in low-income neighbourhoods (Steinbach *et al*., 2011). Pedestrians and cyclists travelling on the road network carry greater risks of injury than those travelling by private car (Smith, Chowdhury and Hammond, 2019).

10.7.34 Driver stress can affect driving behaviour and can be influenced by factors such as frustration (for example as a result of unforeseen congestion, traffic diversions or roadworks) and uncertainty (for example in relation to travel route due to diversions). Issues associated with becoming trapped in traffic for long periods as a result of unforeseen delays can be far more significant for disabled road users (National Highways, 2018), who may for example be far less physically able to remain comfortably seated for long periods of time.

10.7.35 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: changes in the volume and distribution of construction vehicles on the road network
- Pathway: changes to existing traffic routes and patterns, combined with increased volumes of construction traffic on the road network could lead to greater potential for road traffic accidents
- Receptors: people living and working in the vicinity of construction traffic routes. Other receptors include pedestrians and cyclists. More vulnerable groups include children, older people and people in low-income households / areas of social deprivation.

Potential Impacts During Construction

10.7.36 Chapter 16: Traffic and Transport (document reference 6.16) identifies 12 PARs where large or large or moderate effects have been identified in relation to changes in the volume of traffic as a result of Project construction. It is noted that these effects are for the peak construction activity and would be realised over a short duration (e.g. one week). Outside of this period the construction flows would be lower but over

a longer duration (i.e. over the four years of construction) and therefore, the level of significance would be reduced. It is also noted that, for a number of road links the baseline level of traffic is low and that therefore even a small number of construction vehicles would be calculated as a large percentage increase.

10.7.37 A summary of the 12 PARs, including the ward in which they are situated and description of the route in relation to the location of sensitive receptors (for example residential properties, schools, healthcare facilities) is provided in Table 10.12. The location of all PARs is shown in Figure 16.1: Primary Access Routes (document reference 6.16.F1).

Table 10.12 Location of sensitive receptors along primary access routes where large or moderate traffic impacts are predicted

Primary Access Route	Ward	Description in Relation to Sensitive Receptors
Section C		
PAR 23	Copdock and Washbrook Sproughton and Pinewood	Rural road, provides access to farm / fishing pond.
Section D		
PAR 35	Mile End	Via Urbis Romanae is an urban link road on the northern edge of Colchester, passing through a new residential area. Main route including bus lanes.
PAR 36	Mile End Rural North	Connects to PAR 35. Again, an urban road through the northern edge of Colchester. The A134 (Wildeve Avenue) section of the road passes through a new residential area, passing under the A12 and through Great Horkesley. A number of properties and businesses (e.g. The Half Butt Inn) are accessed from this road.
PAR 37	Lexden and Braiswick	Extends from the A12 north along Halstead Road towards Eight Ash Green. A number of residential properties and businesses front on to the road. There is a dental surgery along this link.
Section F		
PAR 49	South Hanningfield, Stock and Margaretting Writtle	Three Mile Hill / London Road runs to the east of Hylands Park. No sensitive receptors located along this section of the route.
PAR 50	Waterhouse Farm	Extending north from Greenbury Way to the south of Writtle, the A1016 passes through the western edge of Chelmsford to the junction with A1060 Rainsford Road. Residential properties and businesses fronting both sides of the road. Chelmsford Fire Station is located along this link.

Primary Access Route	Ward	Description in Relation to Sensitive Receptors
PAR 51	Writtle St Andrews Marconi	Connects with PAR 50 as above. Residential properties and businesses fronting both sides of the road.
Section G		
PAR 59	Hutton East Burstead	The A129 to the west of Billericay. Wide road with residential properties accessed on both sides. Quilters Infant and Junior School is located to the south of the A129 on the western edge of Billericay.
Section H		
PAR 64	Orsett	Section of the A1013 to the north of Southfields, a residential area south of the A13. Link passes Orsett business centre.
PAR 65	Orsett Stanford-le-Hope West East Tilbury	Buckingham Hill Road south of the A1013 towards the village of Linford. The link provides access for a handful of rural properties.
PAR 66	Orsett	Brentwood Road heading south from the A1013 to the west of Southfields. This is a rural road providing access for a handful of residential properties and businesses at its northern extent.
PAR 67	Orsett	The route passes the Whitecroft Care Home, which has been the subject of compulsory acquisition discussions as part of the Examination stage for the Lower Thames Crossing project (Department for Transport, 2025).

10.7.38 The likely significant effects on road safety as a result of the Project due to temporary increases in traffic flow on roads during Project peak year construction for each PAR have been assessed in Chapter 16: Traffic and Transport (document reference 6.16) using baseline personal injury collision data (2021-2023). The safety of road users has been assessed along all road links and junctions, and at temporary and permanent site access points.

10.7.39 The Transport Assessment (document reference 7.11) identifies four collision clusters along the PARs and connecting Local Road Network (LRN) junctions:

- PAR 9: A1066
- PAR 36: A134
- PAR 41: B1018
- A1016 Rainsford Lane / A1016 Parkway junction.

10.7.40 Collision data has been analysed along the full length of the links to identify patterns in accident locations in order to establish any potential safety concerns.

10.7.41 The Transport Assessment (document reference 7.11) identifies that most of the road links forming part of the PARs have an accident rate below or similar to the national accident rate per billion vehicle kilometres. For locations where the accident rate exceeds the national average, in general, these collisions do not suggest a significant pattern or presence of a hotspot and therefore it is reasonable to conclude that the Project would not have any substantial adverse impact on road safety along the PARs.

10.7.42 Chapter 16: Traffic and Transport (document reference 6.16) notes that, while the addition of any amount of traffic can increase the risk of collisions, it is considered that for the majority of road links the temporary increase in construction traffic associated with the Project is unlikely to materially affect safety.

10.7.43 Where preliminary junction designs have been prepared for new site access points, these have been designed in accordance with relevant highways standards and a Stage 1 Road Safety Audit undertaken to ensure safe access/egress of construction vehicles and other road users onto the connecting LRN, thereby reducing the risk of collisions related to the Project.

10.7.44 The Outline CTMP (document reference 7.3) states that a driver information pack would be issued to each driver, and is anticipated to include a variety of detail about standards and practices (for example approved routes, areas where there are road safety concerns, speed limit requirements, locations where parking on the local highway network is not acceptable, details about disciplinary measures for non-compliance and information about routes which could have a higher volume of cyclists).

Likely Health Effects

10.7.45 The wards identified in Table 10.12 have been classified as low or medium sensitivity from a health perspective. The sensitivity of the general population to changes in community safety as a result of construction traffic is assessed as medium. The sensitivity of vulnerable populations (for example children, older people, pedestrians and cyclists) is assessed as high.

10.7.46 While a number of locations have been identified where potential impacts may occur, a combination of factors including the nature of routes identified, the location of sensitive receptors, the duration of potential impact relating to peak construction activity in any one location (i.e. a matter of days/ weeks) and mitigation set out in the Outline CTMP (document reference 7.3) suggests that the magnitude of effect is likely to be **low**. As such a **negligible (not significant)** health effect is anticipated as a result of changes in community traffic (road safety) during construction for the general population and vulnerable groups.

Access to Social Infrastructure (e.g. Healthcare)

10.7.47 This section considers how construction activities may affect public health through changes in accessibility, for example travel times for road users or emergency services, as well as access to social infrastructure such as healthcare facilities.

Overview of Current Evidence and Impact Pathways

10.7.48 Evidence shows that access to services and social infrastructure such as healthcare, education and community facilities can impact people's physical and mental health (Global Research Network on Urban Health Equity, 2010). Access to health facilities

has a direct positive effect on health (Healthy Urban Development Unit, 2013) and is important for providing access to information, screening, prevention and treatments. Older people and groups impacted by disability and long-term illnesses are more dependent on health and social care services (Harner, 2004) and are therefore more vulnerable if access to these services becomes restricted. Transport delays can lead to rescheduled or missed appointments, delayed care, and missed or delayed medication use. These consequences may lead to poorer management of chronic illnesses and thus poorer health outcomes.

10.7.49 Public transport may be more commonly used by vulnerable populations such as children and young people, older people, those without access to a car, people on low incomes and women. Changes in public transport provision may present a barrier to jobs, health services, education, shops and other frequently used services. Difficulties in using public transport can limit older people's participation in society, thereby impacting negatively on their health.

10.7.50 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: changes to the existing road and public transport network (e.g. diversions or road closures)
- Pathway: disruption to travel routes and journey times may affect access to services and facilities
- Receptors: people living and working in the vicinity of the Project who regularly use the road network, including car and public transport users. More vulnerable groups include children, older people, disabled people, and people in low-income households / areas of social deprivation.

Potential Impacts During Construction

10.7.51 Chapter 16: Traffic and Transport (document reference 6.16) considers the effects of the Project on driver delay, both as a result of changes in the volume of construction traffic on the road network and due to planned road closures during the construction period.

10.7.52 Details of the proposed approach for road closures and management are set out in Section 6.8 of the Outline CTMP (document reference 7.3). It is anticipated that roads would only be closed where this is required for safe working. Temporary closures may be required for works including the construction of bellmouth junctions, highway mitigation, installation of buried cabling, and stringing of overhead lines / netting. The Outline CTMP (document reference 7.3) states that, to reduce the impact on local road users, the length of traffic management measures would be kept to a minimum and left in situ for the shortest duration as far as is reasonably practicable.

10.7.53 Chapter 16: Traffic and Transport (document reference 6.16) notes the following in relation to road closures:

- Short term temporary road closures associated with the open-cut cable swathe are expected on some roads. These closures are likely to be for no more than four weeks. A total of 13 affected roads are listed in Table 6.5 of the Outline CTMP (document reference 7.3). Minimal driver delay is expected and therefore the effect on driver delay has been categorised in Chapter 16: Traffic and

Transport (document reference 6.16) as short-term minor adverse, and not significant

- A long term road closure of Wymondham Road (Link PAR 5) is required and a 2.4km diversion route is planned via Flordon Road and B113 Norwich Road. Anticipated journey time increases for drivers would be approximately two minutes.

10.7.54 Chapter 16: Traffic and Transport (document reference 6.16) describes potential delays for bus passengers. Delays would primarily be attributed to the increase in traffic flows along the PARs (as a result of changes in traffic flows associated with committed developments and changes in traffic flows due to construction vehicles associated with the Project). Delays may also occur due to proposed changes to bus routeing or the relocation of bus infrastructure as a result of temporary planned road closures or highway mitigation works. The Outline CTMP (document reference 7.3) states that where the relocation of bus infrastructure may be required, a temporary stop would be provided in a suitable location, following agreement with the relevant highway authority and the bus operators.

10.7.55 There are no expected changes to bus services, bus stops or taxi facilities for over four weeks in any 12-month period during the construction period 2027 to 2031. Although Wymondham Road will experience a long term closure for the duration of construction works, this is not expected to impact bus services due to the provision of a diversion route for general traffic via Flordon Road which would only marginally add time to journey times (approximately two minutes). Chapter 16: Traffic and Transport (document reference 6.16) states that no significant effects associated with changes to the bus network or infrastructure are expected.

10.7.56 Chapter 16: Traffic and Transport (document reference 6.16) states that temporary changes to on street parking as a result of construction activities are minimal. Construction workers and vehicles will have sufficient parking provision within the designated temporary construction compounds and therefore there would be no additional demand for parking spaces within the local road network.

10.7.57 There are three locations along the Project route where some temporary suspension of current parking arrangements may be required. These are:

- Old Ipswich Road (Link PAR 33) - Temporary suspension of the parking bay on the eastern side of Old Ipswich Road opposite the Dragonfly Hotel and informal kerbside parking spaces along the section of Old Ipswich Road located under the A12. The duration of the impact will be limited to periods of less than four weeks and alternative parking is available nearby. There is no social infrastructure in the vicinity of this location that would attract parking demand
- Spinks Lane (Link PAR 43) - Temporary suspension of informal kerbside parking during arrival/departure of Abnormal Indivisible Load (AIL) vehicles. The duration of the impact will be limited to periods of less than four weeks. ‘Keep Clear’ carriageway entrance markings and no stopping restrictions from Monday to Friday 8:00 to 9:30 and 14:30 to 16:00 are already in place outside Maltings Academy. Other social infrastructure located along Spinks Lane includes Witham Leisure Centre, Spinks Lane Therapy Centre and Witham Sports Ground. Each of these facilities already has off-road parking provision
- Highfields Road (Link PAR 43) - Temporary suspension of informal kerbside parking during arrival/departure of AIL vehicles. The duration of the impact will be limited to periods of less than four weeks, with alternative parking locations

available on nearby roads. Witham Town Football and Social Club is accessed from Highfields Road; the club has off-road parking provision.

10.7.58 Stakeholders have highlighted the potential impact of road closures / diversions on access for emergency services and engagement has taken place with The East of England Ambulance Service Trust specifically. The Outline CTMP (document reference 7.3) states that Police, Fire and Ambulance service will be given written notice of planned temporary lane or road closures as well as AIL deliveries and will be kept fully informed throughout the delivery period.

10.7.59 The Outline CTMP (document reference 7.3) identifies different classes of stakeholders that must be considered when designing the traffic management measures and provides further detail of factors that must be addressed in developing the CTMP. These include taking into account particular requirements of, for example, users of social infrastructure facilities such as schools, healthcare settings, care homes and community facilities. As a minimum the CTMP must address factors such as the need to maintain access and egress throughout the construction period; access will be provided to hospitals at all times; community liaison officers will provide updates regarding road closures and diversion routes.

Likely Health Effects

10.7.60 The sensitivity of the general population to changes in access to social infrastructure during the construction phase is assessed as medium. The sensitivity of vulnerable populations (for example older people, people with pre-existing health conditions or disabilities) is assessed as high.

10.7.61 The impact on access to social infrastructure as a result of road closures and / or diversions has been described in Chapter 16: Traffic and Transport (document reference 6.16) as not significant in relation both to driver delay and to potential delays experienced by bus passengers. Although some individuals within the areas affected by road closures / diversions may experience heightened anxiety about potential delay (for example perceptions about how it may impact their ability to attend medical appointments or other requirements), with appropriate communication and community engagement as set out in Appendix E: Community Engagement and Public Information of the Outline CoCP (document reference 7.2), concerns should be effectively mitigated. Similarly, no health impacts are anticipated to arise from the suspension of parking arrangements set out in Chapter 16: Traffic and Transport (document reference 6.16).

10.7.62 As such, the magnitude of effect for both the general and vulnerable populations is considered to be **negligible**. The significance of health effect for the general population is therefore reported as **negligible** and **not significant** for both general and vulnerable populations.

Food Security

10.7.63 There is a potential association between changes in land use, food security and health and wellbeing. This is an issue that has been raised by stakeholders during engagement in relation to the Health and Wellbeing assessment.

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10.7.64 In the UK, food security includes access to sufficient, nutritious and safe food. Loss of agricultural land may affect food security and have both direct and indirect

impacts on the availability and access to healthy food, including for example reduced agricultural produce (direct impacts) which in turn lead to indirect impacts, for example in terms of food quality, price or distribution mechanisms (Mogge and Sonntag, 2017). This may further impact people's food choices and ability to access a healthy diet.

10.7.65 There is a potential population health effect due to the plausible source-pathway-receptor relationship, namely disruption to agricultural land (source), reduced availability of food (pathway), affecting local people (receptors), although it is noted that this is more likely to be a contributory factor to wider, national food security rather than affecting people specifically at local level. Vulnerable groups may include low-income households who may have limited access to alternative food sources, children, young people and people with pre-existing health conditions for whom diet and nutrition is particularly important.

Potential Impacts During Construction

10.7.66 Chapter 6: Agriculture and Soils (document reference 6.6) states that during construction there would be a temporary loss of Best and Most Versatile land (Agricultural Land Classification Grades 1, 2 and 3a) from agricultural productivity. It is calculated that 3,461 ha of agricultural land would be temporarily removed from agricultural production during construction. Of this, 2,923 ha (84.4%) are mapped as Grades 1, 2 and 3a and, as such, the temporary removal is considered to have a temporary negative effect.

10.7.67 In areas of permanent land-take for the Project, the land use is principally arable. Chapter 6: Agriculture and Soils (document reference 6.6) notes that the permanent land-take associated with pylon foundations has been rationalised through Project design, with pylons positioned as close as practicable to field boundaries (where practicable) to minimise impacts on agricultural operations. A variety of standard mitigation measures have been included in the Outline CoCP (document reference 7.2) in relation to ensuring that access to affected land parcels is maintained or alternative access arrangements are communicated to landowners and occupiers. During the operation (and maintenance) phase of the Project, Chapter 6: Agriculture and Soils (document reference 6.6) identifies that there would be limited effects on agricultural operations.

Likely Health Effects

10.7.68 The majority of the population along the Project are not reliant on agricultural produce from the local area and have the ability to purchase healthy food from across a variety of sources. The sensitivity of the general population is therefore considered to be low. Vulnerable populations, including people in low-income households, children and young people, older people and people with pre-existing health conditions are considered to have a high sensitivity as they may have less ability to adapt to change.

10.7.69 The change in agricultural land availability during construction of the Project is likely to be very small in the national context. The magnitude of change is therefore considered to be **low**. The significance of effect is **negligible** and **not significant** for both general and vulnerable population groups.

Access to Jobs and Training

10.7.70 Employment is a critical determinant of health and wellbeing, underpinning financial stability, mental health, and social relationships. Access to stable and meaningful employment opportunities supports physical and mental health, enhances quality of life, and drives economic development.

Overview of Current Evidence / Impact Pathways

10.7.71 General ways in which health can be impacted include the following:

- **Employment:** stable employment contributes significantly to physical and mental health. Financial security derived from steady employment ensures access to healthcare, nutritious food, and safe housing, all of which are crucial for maintaining overall health. Employment also provides structure and purpose, which are essential for mental wellbeing. A study published in Labour Economics (Belloni *et al.*, 2022) found that employment stability is associated with lower levels of stress, depression, and anxiety
- **Impact on social relationships and community:** employment fosters social connections and community engagement. Workplaces are often venues for social interaction, building friendships, and nurturing support networks. According to the New Economics Foundation (nef) research (2014), strong workplace relationships contribute to higher job satisfaction and overall wellbeing. Moreover, community cohesion is strengthened when individuals are gainfully employed and engaged in the local economy
- **Construction activities:** these can influence employment positively by creating a range of job opportunities in various sectors, including construction, engineering, and project management. Construction projects can revitalise local economies, providing employment both during and after construction. Nevertheless, construction can also cause short-term disruptions, such as noise, dust, and temporary road closures, which may affect existing businesses and commuting patterns. Effective communication and planning, including providing alternative routes and schedules, are necessary to mitigate these disruptions and support local businesses during construction phases
- **Equitable access to employment:** addressing employment inequality is crucial for fostering inclusive and healthy communities. Marginalised or vulnerable groups often face barriers to employment, including discrimination, lack of access to education, and transportation difficulties. Ensuring job opportunities are accessible to all and supporting local skill development programmes help improve health outcomes.

10.7.72 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship. The source relates to changes in direct and indirect jobs and economic activity. The pathway would be that, through employment and related changes in income levels, more health supporting resources are provided. Relevant receptors relate to people of working age and their dependants.

Potential Impacts During Construction

10.7.73 Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) provides further detail relating to employment generated by the Project and the impacts on the local, regional and national economy. For the purposes of assessment, the chapter has assumed that, although it is possible that some of the

civil engineering works could be tendered to specific contractors from outside the UK, it is assumed at this stage that all of the civil engineering work would be undertaken by UK based contractors. However, until contracts are let for the construction work, it is not possible to know how much of the construction spend would be within the local economy (this is defined as covering the LPA areas through which the Order Limits pass together with Norwich City Council and Ipswich Borough Council (adjacent to the Project) and West Suffolk Council (where the Project office is located)).

10.7.74 Chapter 4: Project Description (document reference 6.4) describes a maximum peak day construction workforce of approximately 1,720 Full Time Equivalent (FTE) jobs. This is a relatively modest number when compared to large-scale developments in other sectors. Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) notes that previous National Grid project experience indicates that these workers would be split between around 10% from the local area and 90% who would travel into the area from elsewhere (thereby equating to an average of 172 local workers and 1,548 non-local workers at any one time, based on the 1,720 peak FTE) across the 180 km Project.

10.7.75 The majority of construction activities would require trained specialists who are qualified to work on high voltage electricity lines. These are typically sourced from National Grid's existing pool of approved contractors. However, from experience with other National Grid projects, it is likely that a minimum of 10% of the workforce would be sourced from the local labour market. These could, for example, have less specialist roles such as security workers and delivery drivers. This level of local employment, based on the assumption of approximately 4,800 construction employment throughout the four-year construction period, could result in a total job demand of approximately 480 jobs locally. The assessment contained within Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) notes that there would be capacity for this level of employment and likely skillsets within the local labour pool.

10.7.76 In addition to the direct employment generated, there may also be potential for a range of indirect employment opportunities (with resultant skills and employment needs), for example in accommodation, catering, or connected to the supply of materials. However indirect employment effects are likely to be limited in nature and not significant.

10.7.77 Given the above factors, Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) concludes a temporary, short-term, negligible beneficial impact in relation to local employment, which is not significant.

Likely Health Effects

10.7.78 The sensitivity of the general population to changes in access to jobs and training is assessed as low. Vulnerable groups identified as having a high sensitivity to changes in access to jobs and training include people in low-income households, people who are economically inactive or unemployed, children and young people (who may be affected by changes in household income), people who are unable to work due to ill health, lone-parent families, carers and migrant / itinerant workers.

10.7.79 Wards along the route of the Project which have lower proportions of economic activity or poorer educational attainment levels than is the case nationally, or which are within more deprived areas according to the Index of Multiple Deprivation (MHCLG, 2019) include Bunwell and Diss and Roydon (South Norfolk); Palgrave, Needham Market and Bramford (Mid Suffolk); Silver End and Cressing, Witham

North, and Hatfield Peverel and Terling (Braintree); Writtle (Chelmsford); Laindon Park (Basildon); and Chadwell St Mary, Orsett, Little Thurrock Blackshots, Stanford-le-Hope West and East Tilbury (Thurrock). This is shown on Figure 10.3: Indices of Multiple Deprivation Score (document reference 6.10.F3), Figure 10.7: Percentage of the Study Area economically active (document reference 6.10.F7) and Figure 10.8: Percentage of the Study Area with a qualification of Level 2 or lower (document reference 6.10.F8).

10.7.80 There is a clear relationship between good quality employment and factors that promote health or are protective against poor health, particularly mental health. However, the number of new local employment opportunities that would be provided over the course of the construction period is low. Although individuals may therefore benefit, at population level the magnitude of effect for both general and vulnerable populations is **low**, resulting in a **negligible** and **not significant** effect.

Physical Activity (PRoW / Open Space)

10.7.81 During construction there is the potential for disruption to recreational routes or areas of open space which may affect opportunities for physical activity.

Overview of Current Evidence and Impact Pathways

10.7.82 Access to open spaces and nature encourages physical activity, which is vital for maintaining physical health and preventing chronic diseases. Regular engagement in activities such as walking, jogging, and cycling in natural settings improves cardiovascular health, muscle strength, and overall fitness. There are positive associations between access to green space and physical activity (Yang *et al.*, 2021). A recent study found that individuals with easy access to green spaces were more likely to meet physical activity guidelines, leading to reduced risks of obesity, heart disease, and diabetes (Poortinga *et al.*, 2024).

10.7.83 Physical activity is also important for mental health and wellbeing. The mental health benefits of access to nature and open spaces have been increasingly recognised, particularly following the COVID-19 pandemic. Green spaces and recreational routes provide opportunities for relaxation, stress reduction, and mental restoration, which are crucial for overall wellbeing. Individuals with access to green spaces reported lower levels of stress, anxiety, and depression during the pandemic. Nature exposure has been shown to improve mood, enhance cognitive function, and foster a sense of calmness and wellbeing.

10.7.84 Finally, PRoWs and areas of open space have a role to play in fostering social interactions and building community cohesion. This promotes social capital, reduces feelings of isolation, and enhances overall community wellbeing.

10.7.85 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: change in access or amenity of recreational routes such as PRoWs, cycling routes and bridleways or areas of open space
- Pathway: change in behaviour of local residents in terms of take-up of leisure and recreational activities
- Receptors: local residents and visitors to the area, walkers, cyclists and horse-riders. Vulnerable groups include children, people in low-income households or without access to private transport who may be less able to find alternative

opportunities for physical activity, and people with poor physical or mental health who may benefit from physical activity.

Potential Impacts During Construction

10.7.86 The Outline PRoW Management Plan (document reference 7.6) demonstrates a planned approach to the management of PRoWs during construction, with a key aim to maintain public safety while minimising disruption to users. The Study Area for the assessment of PRoWs requiring management includes all PRoWs that would be crossed or directly affected by the Project within the Order Limits, as shown on the Access, Rights of Way and Public Rights of Navigation Plans (document reference 2.5). Usage surveys of affected PRoWs were undertaken during autumn 2024, in late September and October. Further surveys have been undertaken in spring 2025.

10.7.87 The majority of PRoWs would be affected for short durations only and the strategy is aimed at maintaining them as open Rights of Way throughout the construction period, wherever practicable. The Outline PRoW Management Plan (document reference 7.6) identifies five categories of management regime for PRoWs. These are:

- Temporary stopping up with active management (managed use to allow ongoing use of the PRoWs by the public)
- Temporary stopping up with diversion (provision of an alternative temporary PRoWs route. These may be via alternative existing PRoWs or via temporary alternative alignments)
- Temporary stopping up with no diversion (used in some instances where there may be no suitable or safe available diversion for PRoWs and hence temporary closures may be required)
- Permanent stopping up with no diversion (permanent closure of PRoWs and will only be required where no safe permanent diversion is possible)
- Permanent stopping up with diversion (used where permanent diversions will be required where permanent proposed infrastructure impact a PRoW).

10.7.88 The Outline PRoW Management Plan (document reference 7.6) contains a series of measures required for clearly signposting diversion routes, notably that any required temporary diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns. This plan is secured under Requirement 4 of the draft DCO (document reference 3.1). Active management of shared routes and at PRoW crossing points, where construction traffic would mix with PRoW users or cross PRoW, would include the erection of appropriate signage to alert drivers of the potential interface. In some cases, particularly bridleways, an appropriate separation and demarcation (suitable fencing) will be put in place between any parallel construction traffic and PRoW routes to ensure the safety of PRoW users. Short period closures of PRoWs may be implemented at certain locations, whereby the Main Works Contractor(s) patrol and manage use of the PRoW or utilise banksmen to ensure safety of PRoW users.

10.7.89 A number of national trails and long distance paths will be affected during the construction period, including Angles Way, Middy Railway Footpath, Mid Suffolk Footpath, Gipping Valley River Footpath, St Edmund Way / Stour Valley Path, Essex Way, Saffron Trail and St Peter's Way. Chapter 15: Socio-economics,

Recreation and Tourism (document reference 6.15) identifies a residual effect on these routes as ranging from negligible to minor adverse and not significant.

10.7.90 Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) identifies significant effects in relation to seven PRoWs and one bridleway along the Project alignment, as a result of the length of the diversions that would be in place (over 500 m). These are listed below and shown on Figure 15.3: Recreational Land and Recreational Routes (document reference 6.15.F3):

- Mid Suffolk:
  - W-121/006/0 (footpath) – approximately 1.5 km increase in journey length
  - W-129/025/0 (footpath) – approximately 1.3 km increase in journey length
  - W-155/001/0 (bridleway) – approximately 1.3 km increase in journey length
- Colchester:
  - Great Tey FP38 137 – approximately 770 m increase in journey length
  - Great Tey FP50 137 – approximately 1.4 km increase in journey length
  - Great Horkesley FP 30 135 – approximately 780 m increase in journey length
- Chelmsford:
  - Margaretting FP 13 226 – approximately 555 m increase in journey length
- Brentwood:
  - West Horndon FP 69 313 – approximately 640 m increase in journey length.

10.7.91 Chapter 16: Traffic and Transport (document reference 6.16) notes that, in general, long term neutral or slight effects are expected for the majority of the PRoWs subject to diversion and overall, these are not significant. Although, notable increases are expected on the footpaths as listed above, it should be noted that these are primarily leisure routes and an increase in walking distance may not necessarily have adverse effects.

10.7.92 Where a National Cycle Network (NCN) route has been identified as impacted by the Project, consideration has been given to maintaining access along it. All NCN routes affected by the Project are located on existing public highways as follows (all routes are shown on Figure 15.3: Recreational Land and Recreational Routes (document reference 6.15.F3)):

- NCN Route 30 - Ling Road, Palgrave, Suffolk
- NCN Route 51 - B1113 Stowmarket Road, Badley, Suffolk
- NCN Route 1 - Chattisham Road, Chattisham, Suffolk
- NCN Route 1 - Higham Road, Higham, Suffolk
- NCN Route 1 - Rectory Road, Langham, Suffolk
- NCN Route 1 – Langham Lane, Boxted, Langham, Essex
- NCN Route 13 - Mill Road / Fiddlers Hill, Fordham, Essex
- NCN Route 16 - Fairstead Road, White Notley, Essex

- NCN Route 50 - Braintree Road / Fuller Street, Fairstead and Great and Little Leighs, Essex
- NCN Route 50 - Boreham Road, Great and Little Leighs, Essex
- NCN Route 1 - Cow Watering Lane, Writtle, Essex.

10.7.93 Management measures primarily include the provision of crossing protection scaffolding, which would allow the highway and NCN route to continue to be used unaffected throughout construction. However, at locations where this is not practicable, alternate management measures would be implemented, which may involve temporarily stopping up the highway with an appropriate signed diversion being provided. Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) does not identify any significant residual effects in relation to these routes.

10.7.94 All PRoWs affected during construction will be reinstated as soon as practicable after completion of construction works.

10.7.95 Impacts associated with visual amenity during construction have been described earlier in this chapter; Appendix 13.3: Visual Baseline and Assessment (document reference 6.13.A3) describes the impact for receptors in each VRA which include users of the PRoW network and areas of open access land.

10.7.96 Chapter 16: Traffic and Transport (document reference 6.16) assessment of effects on Walkers, Cyclists and Horse riders (WCH) Amenity arising as a result of changes in traffic through the construction phase is presented on Table A16.4.5: Significance of Effect WCH Amenity in Appendix 16.4: Traffic and Transport Construction Effects (document reference 6.16.A4).

10.7.97 The assessment identified the following PARs where the potential effects for WCH Amenity would be temporary, short-term, moderate or large adverse and deemed significant:

- Link PAR 28 - Wick Road / Grove Hill
- Link PAR 36 - A134 Northern Approach Road / A134 Wildeve Avenue / A134 Nayland Road / A134 The Causeway
- Link PAR 37 - A1124 Halsted Road
- Link PAR 43 - Spinks Lane / Highfields Road / Spa Road / Flora Road / Faulkbourne Road / Church Hill
- Link PAR 49 - A414 Three Mill Hill / A1114 London Road
- Link PAR 51 - A1060 Rainsford Road / A1060 Roxwell Road
- Link PAR 65 - Buckingham Hill Road
- Link PAR 66 - Brentwood Road.

10.7.98 Monitoring of the effects on WCH amenity along the above PARs will be undertaken by the appointed Construction Logistics Manager, as secured through the Outline CTMP (document reference 7.3).

10.7.99 Areas of Open Access land affected during the construction period comprise:

- The Marsh, Thrandeston, Suffolk
- Land North of Furze Way, Burgate, Suffolk.

10.7.100 Where temporary construction works are proposed to be undertaken within an area of Open Access land during the construction phase, banksmen will be on site to assist users of the land to move around the temporary construction areas. Where open cable trenches are required across Open Access land, these will be fenced off with a localised diversion provided.

10.7.101 Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) identifies potential impacts on recreational facilities or land and therefore where physical activity may be affected. Significant effects have been identified at:

- Paxman's Angling Club (Section C) where some short-term impacts on usage may be affected
- The fishing lake north-west of Ardleigh (Section C) where there may be permanent acquisition of land and therefore again usage levels may be affected.

10.7.102 Other recreational facilities that may experience some minor loss of access or experience (but not identified as significant) include:

- The equine centre at Writtle (Section F) would see temporary acquisition of fields used to keep horses, however access would be maintained to remaining fields and operational buildings
- Woodland Schools (Section G) where there would be temporary acquisition of land affecting sports pitches at the school as a result of temporary construction access being required. Discussions are ongoing with the school
- Minor adverse (not significant) effects have been identified at Dunton Hills Family Golf Course (Section G) and Orsett Golf Course (Section H) which are likely to experience effects relating to the temporary acquisition of land from small areas of their sites. This is not considered likely to affect users of the facilities.

10.7.103 A minor adverse and temporary effects have also been identified in relation to the Dedham Vale National Landscape (an Area of Outstanding Natural Beauty (AONB)), which is used as a recreational resource by local residents and visitors for walking and other types of physical activity. Temporary acquisition of land is required here in order to construct the underground cables for the Project (as well as other construction activities such as construction access and temporary drainage). Temporary disruption may be experienced for users of this area of countryside in the section between Higham, Stratford St Mary and Lamb Corner. It is noted that potential disruption would be minimised and access to the National Landscape would be maintained and that only a relatively small area would actually be affected by temporary disruption (approximately 205 ha out of the 9,000 ha of the National Landscape). This is considered to align with the duty to 'further the purpose' of National Landscape designations which aims to ensure that National Landscapes can continue to be sustainable, thriving communities whilst also retaining their character and beauty which led to their designation.

Likely Health Effects

10.7.104 The sensitivity of the general population in relation to physical activity is low. Vulnerable populations considered to be of high sensitivity include children, people in low-income households or without access to private transport who may be less able to find alternative opportunities for physical activity and people with poor physical or mental health who may benefit from physical activity.

10.7.105 A variety of potential impacts have been identified during construction in relation to areas of open space, PRoWs and cycle routes. Many of these are spread across the length of the Project alignment. A number of significant adverse impacts have been identified (for example in relation to acquisition of land currently used for recreational purposes or in relation to length of diversion routes for PRoWs). Table 10.13 identifies those wards where potential impacts relating to physical activity might occur along the Project.

Table 10.13 Assessment of potential impacts on physical activity by ward

Category	Wards
Wards where no impacts relating to physical activity have been identified (e.g. no PRoW closures or diversions, no temporary loss of recreational activity)	Newton Flotman, Bunwell, Bressingham and Burston, Bacton, Rickinghall, Stonham, Blakenham, Bures St Mary and Nayland, Capel St Mary, East Bergholt, Hadleigh North, Hadleigh South, Sproughton and Pinewood, Lawford, Manningtree and Mistley, Marks Tey and Layer, Coggeshall, Kelvedon and Feering, Silver End and Cressing, Witham North, Billericay West, Burstead, Laindon Park, Langdon Hills, Chadwell St Mary, Little Thurrock Blackshots.
Wards where the scale of potential impact relating to physical activity is likely to be low (e.g. only one or two PRoWs or areas of open space affected)	Mulbarton and Stoke Holy Cross, Forncett, Diss and Roydon, Palgrave, Gislingham, Mendlesham, Haughley, Stowupland and Wetherden, Needham Market, Battisford and Ringshall, Bramford, Copdock and Washbrook, Brett Vale, Ardleigh and Little Bromley, Boreham and The Leighs, Broomfield and The Walthams, Chelmsford Rural West, Ingatestone, Fryerning and Mountnessing, Herongate, Ingrave and West Horndon, Hutton East, Orsett, Stanford-le-Hope West, East Tilbury.
Wards where the scale of potential impact relating to physical activity is likely to be high (e.g. several PRoWs or areas of open space affected, permanent effects, clustering of impacts)	Rural North, Lexden and Braiswick, Hatfield Peverel and Terling, Writtle, South Hanningfield, Stock and Margaretting.

10.7.106 Four of the five wards identified where the scale of activity is likely to be high, are assessed as being of low to medium sensitivity according to the criteria set out in Section 10.4 of this chapter. One ward, Hatfield Peverel and Terling, is assessed as being of high sensitivity.

10.7.107 The magnitude of impact on physical activity is considered to be low. The duration of effects that may potentially affect people's ability to be physically active (e.g. closures of PRoWs) are generally short-term, with rapid reversal / diversions in place. A relatively small minority of the population would be affected in each ward (despite some wards potentially experiencing a greater level of disturbance). Alternative routes and provision of recreational areas are generally available for use for the period over which effects are predicted to last. Although physical activity is a local public health priority and there is established evidence connecting the benefits of

physical activity to both physical and mental health, the level of change due to the Project is **low** and appropriately mitigated by standard good practice construction management measures. As such, the effect of the Project on physical activity is considered to be **negligible (not significant)** for the general population and **minor adverse (not significant)** for vulnerable groups.

Mental Health and Wellbeing Impact Assessment

10.7.108 Mental health and wellbeing influences a very wide range of outcomes including health behaviour, physical health, educational attainment, employment and earnings, relationships, crime, quality of life, improved recovery rates, and fewer limitations in daily living. As such, these wider determinants can be used as a proxy for understanding mental wellbeing in a community. The wider determinants are:

- Physical security – amenities, overcrowding and incivilities are associated with rates of depression and poor mental health
- Environment – socio-economic inequalities influence experience of the natural environment. Mental health benefits of natural environments include improved quality of life and sense of meaning
- Meaningful activity – work and volunteering promote wellbeing, with social participation found to result in positive outcomes like enhanced self-esteem and social contact
- Good quality food – good nutrition is important for both physical and mental health. People with mental illness often have less healthy diets and make poorer dietary choices than people without mental illness thereby impacting on their recovery
- Leisure – Creative pursuits improve confidence, self-esteem, motivation, happiness and reduce stress and enhance control. Leisure and physical activity enhance wellbeing by increasing feelings of competency and relaxation, distracting from difficulties, as well as enhancing social inclusiveness and support
- Education – Education is associated with reduced risk of poor mental health. Education at all ages reduced the risk of transition to depression and improved mental health with the effect significantly stronger for women.

10.7.109 The body of research specifically considering the impacts of major infrastructure schemes in relation to mental health and wellbeing is steadily growing. For example, research reported on in 2024 (Morley *et al.*, 2024) investigates in relation to High Speed 2 (HS2), the extent to which individuals and communities exposed to the planning, construction and operation of HS2 experience positive or negative mental health and wellbeing impacts, focused specifically on anxiety, depression, and general wellbeing. The research is designed to take place over a 10-year period, beginning in mid-2021, and will provide a body of evidence relating to matters such as how impacts on mental health and wellbeing change over time, whether impacts are felt differently across different sections of the community and what the health economic implications of major infrastructure schemes may be.

10.7.110 Impacts on the mental health and wellbeing of the population along the Project route have been incorporated into the assessment of health effects elsewhere within this chapter, for example in relation to impacts affecting the quality of the places where people live (such as visual or noise impacts associated with construction activity) or in relation to the perception of impacts associated with EMFs. The purpose of this

section is to consider impacts on mental health and wellbeing holistically for the construction phase of the Project.

10.7.111 Table 10.14 identifies potential impacts of the Project during construction in relation to each of the protective factors for mental health and wellbeing set out in the National Mental Health Development Unit (Cooke *et al.*, 2011) toolkit.

Table 10.14 Impacts on mental health and wellbeing during construction

Protective Factor	Potential Impacts of the Project
Enhancing control: individual/lifestyle factors (e.g. ability to make healthy choices, opportunities for self-help); community/social factors (e.g. opportunities to influence decisions in the community, consultation processes, local democracy); socio-economic factors (e.g. financial security, employment); and environmental factors (e.g. control over the physical environment)	The Project is not likely to have an impact on an individual's ability to make healthy choices or to access opportunities for self-help. Similarly, the Project is not likely to have an impact in relation to improving control associated with lifestyle changes as a result of changes in employment or financial security due to the relatively small number of construction jobs that the Project is likely to create (as set out earlier in this section and in Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15). Appendix E: Community Engagement and Public Information of the Outline CoCP (document reference 7.2) provides initial details for how community relations and communication with local residents will take place during the construction period. A free telephone hotline and dedicated email address will be available for residents and other stakeholders, and the Project website will be maintained and managed by the community relations team to ensure information about the Project is kept up to date. A public liaison officer will work closely with the Main Works Contractor(s) to ensure information is communicated in a timely manner to interested parties and affected landowners. A detailed complaints procedure will be developed by the Main Works Contractor(s) in consultation with the community relations team. These processes provide the local community with mechanisms by which some measure of control may be experienced during the construction process (for example in ensuring that there is conformity / compliance with measures set out in the Outline CoCP (document reference 7.2)). In terms of the level of control people feel they have over their physical environment, findings from consultation have highlighted the stress and anxiety experienced by people as a result of potential impacts of the Project on their local area (notably visual impacts). Construction phase mitigation has been identified and is included in

Protective Factor	Potential Impacts of the Project
	Chapter 7: Air Quality (document reference 6.7), Chapter 13: Landscape and Visual (document reference 6.13) and Chapter 14: Noise and Vibration (document reference 6.14).
Increasing resilience: individual/lifestyle (e.g. emotional wellbeing/self-worth, cognitive and social functioning, spirituality, learning and development, arts and creativity); community/social (e.g. trust and safety, social networks and social support); and socio-economic/ environmental (e.g. shared public spaces, a robust local economy, ease of access to services).	The Project is not likely to have an impact on people's cognitive/social functioning, spirituality or opportunity for arts and creativity. Participation in key life activities and the continuation of social networks are not anticipated to be affected during construction. Impacts of the Project on access to community services (for example education or healthcare) have been described earlier in this chapter. Whilst emotional wellbeing and self-worth could be influenced through job creation, as previously noted the level of local employment potentially created (both directly and indirectly as a result of construction spend in the local economy) is anticipated to be relatively small and not significant.
Facilitating participation: individual/lifestyle (e.g. having a valued role, sense of belonging, feeling involved); community/social (e.g. activities that bring people together, opportunities to get involved, processes/delivery that supports social contact); socio-economic/ environmental (e.g. economic, transport networks and access, access to goods and services, cost).	The Project has been an ongoing source of discussion and debate among local residents and may therefore have indirectly created or enhanced social interaction and a sense of 'being involved'. Impacts on local transport networks during construction have been identified in Chapter 16: Traffic and Transport (document reference 6.16), although no significant effects have been identified in relation to driver delay or delay for bus passengers. Participation in community or social activities are not anticipated to be affected during construction. Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) identifies a number of temporary, short-term, minor adverse and not significant impacts in relation to access to community facilities along the Project route, notably Bullen Lane allotment (Section B); the equine centre at Writtle University College and St Mary's Church, Buttsbury (Section F); and Woodland Schools – Hutton Manor and Little Acorns (Section G). For each of these facilities, mitigation measures set out in the Outline CoCP (document reference 7.2) and Outline CTMP (document reference 7.3), will ensure that access would be maintained during construction. For Woodland Schools, where the Project requires the temporary acquisition of land (e.g. sports pitches

Protective Factor	Potential Impacts of the Project
	and sports ground) from the nursery and primary school during construction to enable temporary construction access for temporary third-party work; discussions are ongoing with the school as to how access would be maintained and managed.
Promoting social inclusion: individual/lifestyle (e.g. trust others, feel safe at home, positive identities); community/social (e.g. practical support, low levels of crime, conflict resolution); socio-economic/ environmental (e.g. challenging stigma of mental illness, discrimination and tackling inequalities).	The Project is not likely to have an impact on people's ability to trust others, feel safe at home or engender positive identities. It is acknowledged that certain sensitive groups such as older people may feel more vulnerable as a result of the presence of construction workers/activity in an area. Appendix E: Community Engagement and Public Information of the Outline CoCP (document reference 7.2) sets out mechanisms, such as a Project helpline and email address, that residents can use to report issues or concerns relating to the Project during construction. Dissemination of information to local communities during the construction period via the Project website can play a valuable role here in reassuring people about activities that are ongoing. The Project is not likely to have any impact on challenging the stigma of mental illness or challenging discrimination.

Operation (and Maintenance)

10.7.112 The Health and Wellbeing assessment has considered residual effects during the operation (and maintenance) phase associated with changes to the following health determinants:

- Noise
- Visual amenity
- Perception of health risk from EMF.

Noise

10.7.113 Noise effects resulting from the operation (and maintenance) phase of the Project have the potential to adversely affect health and wellbeing.

Overview of Current Evidence and Impact Pathways

10.7.114 The overview of current scientific evidence and impact pathways associated with noise has been outlined in the previous section in relation to construction. A potential population health effect during the operation (and maintenance) phase of the Project

is also considered likely because there remains a plausible source-pathway-receptor relationship:

- Source: changes in noise levels as a result of the operation (and maintenance) of the Project
- Pathway: disruption experienced by people as a result of changes in noise levels
- Receptors: people living or working in the vicinity of the Project. Vulnerable groups may include children, older people (who may be more likely to experience hearing-related conditions), people with pre-existing physical and mental health conditions, people with newborn babies, shift workers and people in low-income households.

Potential Impacts During Operation (and Maintenance)

10.7.115 Chapter 14: Noise and Vibration (document reference 6.14) states that the impact of operational noise from the proposed substations on all nearby Noise Sensitive Receptors (NSRs) would result in a residual negligible to minor adverse effect which is considered to be not significant. It is noted that the assessment is based on early design information and standard noise mitigation measures and that further detailed design would be undertaken by the developers, including consideration of specific noise mitigation measures.

10.7.116 Operational noise from overhead lines is scoped out of the ES in accordance with the EIA Scoping Opinion (document reference 6.20), on the basis that a low noise conductor system is proposed. The proposed overhead line system would use 'triple Araucaria' conductors or alternative technology that performs to the same or better standard in relation to noise on standard lattice pylons for reducing operational noise (as reported in Chapter 4: Project Description (document reference 6.4)). This would be regarded as practically quiet.

10.7.117 However, information on noise from overhead lines is provided in Appendix 14.5: Operational Noise from Overhead Lines (Informative) (document reference 6.14.A5). This document provides information to demonstrate that any noise that may occur during the operation of the overhead transmission line would be not significant. It sets out a worst-case assessment for 'wet noise' levels (the highest noise levels generated by an overhead line generally occur during rainfall) and considers potential effects in relation to vulnerable subgroups (as set out by the WHO), residential receptors, and schools and hotels. The assessment shows that the predicted noise levels are significantly below the No Adverse Impact Criteria for all three NSR groups and affirms that operational noise from the proposed 400 kV overhead line would therefore be not significant.

Likely Health Effects

10.7.118 The sensitivity of the general population is low. The sensitivity of vulnerable groups (for example children, older people, people with pre-existing health conditions, parents with newborn babies, shift workers) to changes in noise levels is high.

10.7.119 No significant effects have been identified in relation to operation noise for any NSRs within the Study Area. Accordingly, the magnitude of effect for both the general population and vulnerable groups is considered to be negligible. The significance of health effect as a result of operational noise is therefore considered to be negligible and not significant for both the general population and vulnerable groups.

Visual Amenity

10.7.120 Similarly to the construction phase, community mental health and wellbeing can be impacted by changes to landscapes and the views that exist as a result of the permanent visual changes the Project would bring.

Overview of Current Evidence and Impact Pathways

10.7.121 As noted for construction, visual amenity is critical in shaping individuals' perceptions of their surroundings, influencing mental wellbeing, stress levels, and overall quality of life. Research suggests that the mental health impact associated with new infrastructure (in this case electricity pylons) can change over time, particularly with prolonged exposure. Initially, some individuals may experience negative feelings or stress due to the visual presence of pylons. However, with extended exposure, habituation or adaptation may occur, leading to a decrease in the perceived negative impact. This may be accompanied, for example, by changes brought about by screening measures, such as landscaping which would mature over time.

10.7.122 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: changes in the character of the landscape / townscape as a result of the presence of permanent energy infrastructure
- Pathway: changes in the appearance of an area can impact people's mental health and wellbeing due to changes in the way they feel about an area or place or concerns about how the new infrastructure may impact their life plans (for example retirement or property values)
- Receptors: people living in proximity to the Project who may directly experience changes in visual amenity.

Potential Impacts During Operation (and Maintenance)

10.7.123 Chapter 13: Landscape and Visual (document reference 6.13) describes the visual impacts associated with the Project during the operation (and maintenance) phase on landscape and visual receptors. The chapter notes that there would be significant negative visual effects on visual receptors within most of the VRAs which are directly affected by the Project at Year 1 of operation. These significant effects are related to the introduction of the proposed overhead line, Cable Sealing End (CSE) compounds, substations or substation extensions into close to medium distance views. By Year 15 of operation, effects on some visual receptors in proximity to CSE compounds and substations would reduce as a result of landscape mitigation. For visual receptors within VRAs along the proposed underground cable alignment, there would also be significant negative effects at Year 1 relating to the loss of vegetation.

10.7.124 Appendix 13.4: Residential Visual Amenity Assessment (RVAA) (document reference 6.13.A4) has been completed for the Project, which describes the change in views likely to be experienced by residents at the closest residential properties to the Project (within approximately 200 m). The RVAA identifies a total of 364 habitable residential buildings within the 200 m Study Area using OS Address Data. Of these, a number were scoped out of further assessment due to factors including that proposed pylons would be replacing existing pylons and therefore views are not considered to change significantly; distance of properties from the nearest pylon is

greater than 200 m; or that properties are located within the undergrounding section of the Project and therefore operation (and maintenance) stage effects are not considered to significantly impact on visual amenity.

10.7.125 Of those properties scoped into further assessment (Step 3 of the RVAA assessment process), a total of 50 properties / property groups are expected to experience visual change of a high magnitude. A more detailed assessment of effects on residential visual amenity (Step 4 of the RVAA assessment process) has been carried out for these properties and property groups to identify if the potential effects would be of such a magnitude that they may breach the Residential Visual Amenity Threshold (which specifically considers, for example, whether the Project blocks the only available view from a property; is overwhelming in views in all directions from the property; is unpleasantly encroaching; or is inescapably dominant from the property).

10.7.126 Following detailed assessment of these properties / property groups, the RVAA (document reference 6.13.A4) finds no instances where effects on residential visual amenity would be so great that they would affect living conditions and render those properties as unattractive places to live. It is noted that some properties / property groups do come close to this threshold and that mitigation measures have been recommended to reduce effects.

10.7.127 Table 10.15 summarises the wards along the Project alignment which contain properties that have formed part of the RVAA.

Table 10.15 Assessment by ward of properties included in RVAA

Category	Wards
No properties included within RVAA assessment	Bacton, Bramford, Rickinghall, Brett Vale, Bures St Mary and Nayland, Capel St Mary, East Bergholt, Hadleigh North, Hadleigh South, South East Cosford, Coggeshall, Witham North, Langdon Hills, East Tilbury, Chadwell St. Mary, Little Thurrock Blackshots, Lawford, Manningtree and Mistley.
Properties taken to RVAA Step 3	Newton Flotman, Palgrave, Gislingham, Haughley, Stowupland and Wetherden, Stonham, Needham Market, Battisford and Ringshall, Blakenham, Copdock and Washbrook, Kelvedon and Feering, Hatfield Peverel and Terling, Boreham and The Leighs, Chelmsford Rural West, Writtle, Ingatestone, Fryerning and Mountnessing, Billericay West, Hutton East, Herongate, Ingrave and West Horndon, Laindon Park, Stanford-le-Hope West.
Properties taken to RVAA Step 4 (detailed assessment)	Mulbarton and Stoke Holy Cross, Forncett, Bunwell, Bressingham and Burston, Diss and Roydon, Mendlesham, Sproughton and Pinewood, Ardleigh and Little Bromley, Rural North, Lexden and Braiswick, Marks Tey and Layer, Silver End and Cressing, Broomfield and The Walthams, South Hanningfield, Stock and Margaretting, Burstead, Orsett.

10.7.128 Chapter 13: Landscape and Visual (document reference 6.13) describes embedded mitigation that forms part of the Project design. This includes sensitive routeing and siting of the alignment and Order Limits; undergrounding proposed in four locations to reduce effects on views and setting; and landscape plans and planting schedules as outlined in the Outline Landscape and Ecological Management Plan (LEMP)

(document reference 7.4). The Outline LEMP (document reference 7.4) notes that the land around National Grid permanent assets, where there is sufficient space, has been defined as Environmental Areas (for example the land around Norwich Main Substation, EACN Substation and six CSE compounds). These areas will provide landscape and visual screening benefits, as well as offering ecological value. Indicative landscaping proposals have been prepared for each of these Environmental Areas.

Likely Health Effects

10.7.129 Members of the general population who are in good physical and mental health have a greater ability to accept or respond to changes in their physical environment and as such the sensitivity of this group is low. The sensitivity of vulnerable groups to changes in visual amenity is high; vulnerable groups include people with existing poor mental health, people who may have a high degree of concern about the Project, and people in low-income households who may have less ability or resources to adapt to change.

10.7.130 There are likely to be individuals in every ward intersecting with the Order Limits who experience some degree of impact on their mental health and wellbeing (for example anxiety or stress) due to the operation (and maintenance) phase of the Project. Of those wards experiencing the greatest visual impacts (listed in Table 10.14), seven wards are characterised as being of low sensitivity (Rural North, South Hanningfield, Stock and Margaretting, Sproughton and Pinewood, Ardleigh and Little Bromley, Lexden and Braiswick, Marks Tey and Layer and Burstead); a further eight wards are characterised as being of medium sensitivity (Mulbarton and Stoke Holy Cross, Forncett, Bunwell, Diss and Roydon, Broomfield and The Walthams, Mendlesham**,** Silver End and Cressing, and Orsett); and one ward is characterised as being of high sensitivity (Bressingham and Burston).

10.7.131 There is scientific evidence that identifies a link between visual change and health outcomes; there is also evidence that suggests habituation and adaptation with time. Whilst there are likely to be individuals who experience adverse mental health and wellbeing impacts associated with visual change, this is not considered to be at a significant scale or to disproportionately affect health deprived populations. The magnitude of effect for the general population and vulnerable groups is considered to be **low**. This reflects the fact that a small minority of the population are likely to be affected and that change in quality of life may be moderate. This results in a **minor adverse (not significant)** health effect for both the general population and vulnerable groups.

Perception of Health Risk from Electric and Magnetic Fields

10.7.132 EMFs arise from the generation, transmission, distribution and use of electricity. Electric fields (measured in V/m (volts per metre)) depend on the operating voltage of the equipment producing them. They are shielded by most common building materials, trees and fences and diminish rapidly with distance from the source. Magnetic fields are found in all areas where electricity is in use (e.g. offices and homes), arising from electric cabling and equipment in the area. They are measured in μT (microteslas) and depend on the electrical currents flowing, which vary according to the electrical power requirement at any given time. Magnetic fields are not significantly shielded by most common building materials or trees; as with electric fields, they diminish rapidly with distance from the source.

10.7.133 The ICNIRP (1998) has set public exposure guideline limits to protect against direct effects of EMF exposure; the weight of scientific evidence is against EMFs causing ill health in humans at levels below the ICNIRP (1998) guideline limits. The Government has addressed uncertainty in this area by adopting precautionary measures, set out in the Code of Practice on optimum phasing (Department of Energy and Climate Change, 2012), which National Grid follows.

10.7.134 Health impacts associated with EMFs themselves have been scoped out of this assessment. National Grid has produced an Electric and Magnetic Field Compliance Report (document reference 7.8) which provides an assessment and conclusions of the compliance of EMFs produced by the Project with the requirements of NPS EN-5 (DESNZ, 2024b). Compliance with the relevant guidelines and practices in force in the UK ensures that there would be no significant health or environmental effects of EMFs.

10.7.135 However, during statutory and non-statutory consultation, feedback has emerged from local communities relating to ongoing anxieties about the perceived effects of EMFs, particularly on vulnerable populations such as children.

Overview of Current Evidence and Impact Pathways

10.7.136 Perceived impacts of pylons and power lines, while not linked to adverse health effects by scientific consensus, can nevertheless impact mental wellbeing and quality of life. Fear and anxiety related to potential EMF exposure can lead to a range of symptoms, including headaches, fatigue, and sleep disturbances (WHO, 2016). These concerns can be further exacerbated by limited scientific information or conflicting opinions. For example, media portrayals can distort public understanding of risk (Hansen, 1993), leading to heightened stress and anxiety and ultimately a sense of uncertainty and powerlessness (Jay, 2007).

10.7.137 The impact on mental health can be particularly acute for individuals who strongly believe that EMFs are causing their symptoms, even if medical evidence does not support a causal link. This can lead to a cycle of anxiety and blame, affecting daily activities and relationships.

10.7.138 Studies have suggested that people hold negative health expectations of exposure to EMFs associated with power lines (Visschers *et al.*, 2007). Porsius *et al.*, (2015) specifically studied residents' health responses in relation to a new high voltage power line and found a negative health impact on health perceptions in nearby residents.

10.7.139 Social factors like community beliefs, personal experiences and even social media further shape risk perception. In the UK, community campaigns against infrastructure projects often reflect these fears, impacting mental health as people feel powerless against perceived threats.

10.7.140 Furthermore, the visual impact of pylons and power lines can contribute to feelings of unease and displacement, especially in areas where they are perceived as detracting from the natural landscape (considered as part of the preceding section).

10.7.141 A potential population health effect is considered likely because there is a plausible source-pathway-receptor relationship:

- Source: the location of electrical infrastructure where this is in proximity to communities

- Pathway: anxiety amongst local communities about the perceived health effects associated with EMFs
- Receptors: local residents. Community perception is that some groups are more vulnerable than others to potential health effects associated with EMFs, with concerns particularly relating to children or pregnant women. Other vulnerable groups are likely to be people with poor mental health and wellbeing, or people in low-income households who may be concerned about the potential effects but who do not have the capacity or resources to relocate.

Potential Impacts During Operation (and Maintenance)

10.7.142 The Project comprises 159 km of new overhead line supported on approximately 509 pylons (with an additional section through the Dedham Vale National Landscape (approximately 21 km) that is made up of underground cabling) together with CSE compounds and two new 400 kV substations (on the Tendring Peninsula and to the south of Orsett Golf Club in Essex). Figure 4.1: Proposed Project Design (document reference 6.4.F1) shows the location of the main features of the Project on an Ordnance Survey mapping base, such that locations of communities and properties can be seen.

10.7.143 Chapter 4: Project Description (document reference 6.4) notes that environmental appraisal has been an integral part of the Project design process since conception, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable. Embedded mitigation measures include the sensitive routeing and siting of the alignment and Order Limits to avoid and reduce as far as possible the effects on receptors including socio-economic receptors (for example settlements and residential areas).

10.7.144 As stated earlier the Project has been designed to comply with existing National Grid standards and relevant external guidance and processes, such as the ICNIRP guidelines (ICNIRP, 1998) for reducing effects in relation to EMFs. Exposure guidelines have been 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 NPS EN-5 (DESNZ, 2024b).

10.7.145 Recognising that concerns about EMF may adversely impact some people's mental health by heightened anxiety, 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 for members of the public to access. An EMF helpline is also available to answer any questions or concerns about the subject. EMF specialists have been present at all public consultation events, to discuss and address any concerns. These measures are aimed at providing information on EMFs and the measures in place to protect, helping to reduce anxiety around the subject prior to construction and operation (and maintenance) of the asset. Provision of support and information in this way will continue during the operation (and maintenance) phase of the Project.

Likely Health Effects

10.7.146 Effects on mental health and wellbeing arising from the perceived health impacts associated with EMFs are not likely to be experienced equally by communities along

the Project route. The majority of the general population is considered to be of low sensitivity (i.e. they have a high ability to adapt to change and could be described as '*a community whose outlook is predominantly ambivalence with some concern*' (extracted from Table 10.6).

10.7.147 Groups who may be categorised as being of high sensitivity may include people who have adverse feelings about the Project in general; people who consider themselves to be in close proximity to the overhead lines and associated infrastructure for long periods of time (for example people who are not only living, but also potentially working, or using social infrastructure facilities in close proximity); people who are concerned about dependants or family members who may live or work in close proximity to the overhead lines and associated infrastructure; people with more limited social support networks (for example older people) and people with poor mental health and wellbeing who may have less capacity to cope with change or additional anxiety.

10.7.148 Table 10.16 considers how this aspect of the Project relates to each of the four protective factors for mental health and wellbeing as set out in the MWIA Toolkit.

Table 10.16 Impacts on mental health and wellbeing relating to perceptions of EMFs during operation (and maintenance)

Protective Factor	Potential Impacts of the Project in Relation to Perceptions of EMFs During Operation (and Maintenance)
Enhancing control: individual/lifestyle factors (e.g. ability to make healthy choices, opportunities for self-help); community/social factors (e.g. opportunities to influence decisions in the community, consultation processes, local democracy); socio-economic factors (e.g. financial security, employment); and environmental factors (e.g. control over the physical environment)	People, including vulnerable populations such as those described earlier, may feel less control over the physical environment within which they live or work. This may extend to concern about dependants or family members perceived as more vulnerable (e.g. children or older people) who will be living in close proximity to the Project alignment. Control could be enhanced through the dedicated programme of communication and scientific information from National Grid relating to EMFs as described in paragraph 10.7.146 (e.g. helpline, website).
Increasing resilience: individual/lifestyle (e.g. emotional wellbeing/self-worth, cognitive and social functioning, spirituality, learning and development, arts and creativity); community/social (e.g. trust and safety, social networks and social support); and socio-economic/ environmental (e.g. shared public spaces, a robust local economy, ease of access to services).	Resilience may be impacted through misinformation, entrenched views about the Project and / or EMFs and articles within the press / social media. As described above, resilience could be enhanced both through transparent communication and public education – providing opportunities for local residents to interact with clear and accessible scientific information relating to EMFs.
Facilitating participation: individual/lifestyle (e.g. having a valued role, sense of belonging, feeling	The Project is likely to be an ongoing source of discussion and debate among local residents, particularly during the early years of the operation

Protective Factor	Potential Impacts of the Project in Relation to Perceptions of EMFs During Operation (and Maintenance)
involved); community/social (e.g. activities that bring people together, opportunities to get involved, processes/delivery that supports social contact); socio-economic/ environmental (e.g. economic, transport networks and access, access to goods and services, cost).	(and maintenance) phase. This in itself may continue to create or enhance social interaction and a sense of 'being involved'. Importantly, this should be coupled with accurate information about EMFs, as described in relation to the provision of clear and accessible information above (for example information clearly signposted on the website referred to in paragraph 10.7.146 and the EMF helpline).
Promoting social inclusion: individual/lifestyle (e.g. trust others, feel safe at home, positive identities); community/social (e.g. practical support, low levels of crime, conflict resolution); socio-economic/ environmental (e.g. challenging stigma of mental illness, discrimination and tackling inequalities).	Promoting social inclusion is not likely to be relevant.

10.7.149 The magnitude of impact for both the general population and for vulnerable groups is considered to be **low**. There is very low exposure to change, any change may be categorised as a moderate change in quality of life and only a small minority of the population would be affected. As such, the significance of effect would be **minor adverse** for the general population (and **not significant**) and **minor to moderate adverse** for vulnerable groups (a moderate adverse effect would be significant). Significance would likely be reduced to **minor adverse (not significant)** through the introduction of measures described in Table 10.16, in relation to communication and public education activities.

10.8 Monitoring

10.8.1 'Monitoring measures' are defined in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) as *'…the monitoring of any significant adverse effects on the environment of proposed development, including any measures contained in a requirement imposed by an order granting development consent'*.

10.8.2 No requirement for monitoring measures have been identified for health and wellbeing.

10.9 Sensitivity Testing

10.9.1 Sensitivity testing has been undertaken as described in Chapter 5: EIA Approach and Method (document reference 6.5) to determine if delays or an extension to the construction programme, changes to the design within the Limits of Deviation (LoD) or if any of the design scenarios presented in Table 4.4 in Chapter 4: Project Description (document reference 6.4) would affect the assessment.

Flexibility in Construction Programme

10.9.2 The assessment is based on a four-year vegetation clearance and construction programme, as identified within Chapter 4: Project Description (document reference 6.4) that would commence in 2027.

10.9.3 Should the construction programme be delayed or extended, there may be prolonged impacts relating to mental health and wellbeing, as a result of the ongoing uncertainty and associated stress and anxiety. There would be no new or different likely significant effects anticipated to those identified in Section 10.7.

Flexibility in Design

Flexibility Within the Limits of Deviation

10.9.4 The assessment presented within this chapter has been undertaken on the design shown on Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). It should be noted that as described in Chapter 4: Project Description (document reference 6.4), the Project's design is not fixed and could be subject to change within the defined LoD within the parameters shown on the Works Plans (document reference 2.3) unless commitments have been made otherwise.

10.9.5 Sensitivity testing considering alternative pylon and underground cable routes within the proposed LoD, has shown that there would be no new or different likely significant effects because of the pylons being placed in a different location. Mitigation measures set out in the Outline CoCP (document reference 7.2), Outline CTMP (document reference 7.3), and Outline PRoW Management Plan (document reference 7.6) would remain effective in minimising potential impacts on health and wellbeing.

Flexibility Within the Order Limits

10.9.6 There are 19 locations where design scenarios have been identified within Chapter 4: Project Description (document reference 6.4). None of the design scenarios, following the implementation of mitigation measures in the Outline CoCP (document reference 7.2), Outline CTMP (document reference 7.3) and Outline PRoW Management Plan (document reference 7.6) would alter the significance of effects reported in this chapter. This is because with mitigation in place, any health and wellbeing effects would be the same as those identified and assessed.

Abbreviations

Abbreviation	Full Reference
AIL	Abnormal Indivisible Load
AONB	Area of Outstanding Natural Beauty
BPM	Best Practical Means
CSE	Cable Sealing End
CoCP	Code of Construction Practice
COPD	Chronic Obstructive Pulmonary Disease
CTMP	Construction Traffic Management Plan
DESNZ	Department for Energy Security and Net Zero
DCO	Development Consent Order
EACN	East Anglia Connection Node
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic Field
ES	Environmental Statement
FTE	Full Time Equivalent
HGV	Heavy Goods Vehicle
HS2	High Speed 2
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
JSNA	Joint Strategic Needs Assessment
LEMP	Landscape and Ecological Management Plan
LPA	Local Planning Authority
LRN	Local Road Network
LSOA	Lower Super Output Area
MHCLG	Ministry for Housing, Communities and Local Government
MWIA	Mental Wellbeing Impact Assessment
NCN	National Cycle Network
NETS SQSS	National Electricity Transmission System Security and Quality of Supply Standard

Abbreviation	Full Reference
NMU	Non-Motorised User
NO_2	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
NSR	Noise Sensitive Receptors
OEP	Office for Environmental Protection
OHID	Office for Health Improvement and Disparities
ONS	Office for National Statistics
PAR	Primary Access Route
PHE	Public Health England
PM	Particulate Matter
PRoW	Public Right of Way
RVAA	Residential Visual Amenity Assessment
UK	United Kingdom
UKHSA	UK Health Security Agency
µT	microteslas
VRA	Visual Receptor Areas
WCH	Walkers, Cyclists and Horse Riders
WHIASU	Wales Health Impact Assessment Support Unit
WHO	World Health Organization

Glossary

Term	Definition
Abnormal Invisible Load	A large load which cannot 'without undue expense or risk of damage' be divided into two or more smaller loads for the purposes of being transported by road, and which exceeds limits set out in terms of weight (>44 tonnes), length (>18.65 m), and width (>2.9 m).
Additional mitigation	Comprises measures over and above embedded and standard mitigation measures to reduce environmental effects. This would include, but not be limited to, mitigation required for protected species.
Alignment	The proposed overhead line and underground cable route.
Cable	An insulated conductor designed for underground installation.
Code of Construction Practice	A code of construction practice sets out the standards and procedures to which a developer (and its contractors) must adhere in order to manage the potential effects of construction works.
Construction Traffic Management Plan	Plan detailing the procedures, requirements and standards necessary for managing the traffic effects during construction of the Project so that safe, adequate and convenient facilities for local movements by all transport modes are maintained throughout the construction process.
Development Consent Order	A statutory instrument which grants consents and other rights to build a Nationally Significant Infrastructure Project, as defined by the Planning Act 2008.
Embedded design measures	Mitigation measures are those that are intrinsic to and built into the design of the Project.
Environmental Impact Assessment (EIA)	An assessment of the likely effects of a development project on the environment, which is reported in an Environmental Statement that is publicised and consulted on and taken into account in the decision on whether a project should proceed.
Environmental Statement (ES)	The main output from the EIA process, an ES is the report required to accompany an application for development consent (under the Infrastructure Planning (EIA) Regulations 2017) to inform public and stakeholder consultation and the decision on whether a project should be allowed to proceed. The EIA Regulations set out specific requirements for the contents of an ES for Nationally Significant Infrastructure Projects.
Full Time Equivalent (FTE)	Unit of measurement used to calculate the total full time hours worked by staff.

Term	Definition
Haul road	A route used by construction traffic within the Order Limits to access a working area from a site access point.
Kilovolt	1,000 volts
Level 2 Qualification	Typically refers to an educational qualification that is equivalent to General Certificate of Secondary Education (GCSEs) at grades 9-4 (A*-C) in England, Wales and Northern Island or National vocational Qualification (NVQ) Level 2.
Local Planning Authority	The public authority whose duty it is to carry out specific planning functions for a particular area.
Local Study Area	This comprises wards that intersect with the Order Limits. The Order Limits represent the area in which temporary and permanent works have the potential to affect Socio-economics, Recreation and Tourism receptors directly.
Mitigation	The action of reducing the severity and magnitude of change (impact) to the environment. Measures to avoid, reduce, remedy or compensate for significant adverse effects.
Nationally Significant Infrastructure Project	Typically a large scale development of national importance that requires development consent from the Secretary of State, under the Planning Act 2008.
Order Limits	The maximum extent of land within which the authorised development may take place.
Overhead line	Conductor (wire) carrying electric current, strung from pylon to pylon.
Ordnance Survey	The OS is the national mapping agency for Great Britain and produces large scale maps.
Project Section	Geographical ‘sections’ have been identified that break the Project down into smaller units for ease of description within the documentation. These Project Sections are broken down into eight sections based largely on Local Planning Authority boundaries.
Public Right of Way (PRoW)	A footpath, bridleway or byway accessible to all members of the public.
Pylon	Structures that support the overhead line (conductors).
Quality of life	There is no IEMA definition for ‘quality of life’. The World Health Organization defines quality of life as ‘an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns’ (WHO, 2012).

Term	Definition
Scoping	Scoping is the process of determining the content and extent of matters that should be covered in the Environmental Impact Assessment.
Scoping Report	Report determining the content and extent of matters that should be covered in the Environmental Impact Assessment.
Service quality implications	Changes in the quality of services that support or facilitate good health (for example health services, schools, social care).
Site Access Points	A location connecting a construction site to the public highway.
Socio-economics	The study of the interrelation between economics and social behaviour.
Standard mitigation measures	Comprise management activities and techniques, which would be implemented throughout construction of the Project to limit effects through adherence to good site practices.
Underground cable	An insulated conductor carrying electric current designed for underground installation. Underground cables link together two Cable Sealing End compounds.
Wider Study Area	This comprises the boundaries of the Local Planning Authorities in which the Project is located.

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