Rosefield Solar Farm

Environmental Statement

Volume 4
Appendix 5.5: Health and Wellbeing Summary Statement
(Tracked)

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Rosefield Energyfarm Limited

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Annexes

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1. Introduction

1.1. Background & Purpose of the Document

1.1.1. ~~This~~ **Annex A** of this document has been updated at Deadline 3 in to provide an update in response to comments raised by Claydons Solar Action Group relating to effects on residential visual amenity.

~~1.1.1. Deadline 2 in response to the Written Representations received from Claydons Solar Action Group **[REP1-128]**, which has been helpful in providing additional context for the portion of the population assessed that is registered with a GP at the 3W Health practice. The **Health Effects Report** (**Annex A**) has been updated accordingly and submitted at Deadline 2 to account for this information and provide a more explicit conclusion in respect of the sensitivity of relevant sub-populations (older people, and people facing access or geographic factors) to change.~~

1.1.2. The document references have not been updated from the original submission. Please refer to the **Guide to the Application [EN010158/APP/1.2.~~87~~]** for the list of current versions of documents.

1.1.3. This **Health and Wellbeing Summary Statement** has been prepared by Rosefield Energyfarm Limited (the Applicant) and summarises the approach to the consideration and assessment of effects of the Proposed Development on human health and wellbeing (both physical and mental health) from across various application documents.

1.1.4. At an early stage, the Applicant advised of its intention to consider effects on human health through individual topic chapters within the Environmental Statement (ES) – **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]** specifically set out (at paragraphs 5.6.1 to 5.6.5) that:

"It is proposed that consideration of the potential effects to human health as a result of the Proposed Development will be covered through the findings of other assessments undertaken as part of the EIA process, as follows: Air quality; Landscape and visual; Noise and vibration; Transport and access; and Population.

Each of these chapters within the EIA Scoping Report and subsequent PEIR and ES will consider the potential effects to human health within their own assessments. Outside of the EIA process, a glint and glare assessment will be undertaken which will consider the potential human health effects from glint and glare.

As any potential human health impacts will be captured by the aforementioned assessments and there are not expected to be any

significant human health impacts outside of these assessments, it is proposed that human health is not subject to dedicated assessment and therefore excluded from the scope of the EIA."

1.1.5. The Scoping Opinion (**ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4])** adopted by the Planning Inspectorate (PINS), on behalf of the Secretary of State, confirmed that this approach was acceptable. Paragraph 2.3.6 of the Scoping Opinion states that:

"The Inspectorate is content with this approach, however the ES should clearly set out potential impacts to human health from the Proposed Development during construction, operation and decommissioning and cross-reference to where impacts are assessed within the ES; this may extend beyond the chapters proposed above.

The Applicant's attention is drawn to the comments of Buckinghamshire Council (Appendix 2 of this Scoping Opinion) in relation to the approach to assessing potential impacts on human health."

1.1.6. In line with the proposed approach set out through the scoping process, and in consideration of comments received from Buckinghamshire Council, the UK Health Security Agency (UKHSA) and other stakeholders including members of the community in the pre-application stage (through the scoping opinion, responses to statutory consultation, and engagement), the Applicant has provided this **Health and Wellbeing Summary Statement** in order to:

- Summarise, in a single document, how health and wellbeing has been considered in the development of the Proposed Development including through design, impact assessment, and the approach to consultation and engagement;
- Set out where individual topic assessments have considered health and wellbeing effects, and report them in terms of significance, applying a health 'lens'; and
- Demonstrate regard to and consideration of guidance on the assessment of effects on health and wellbeing.

1.2. Structure of this Document

1.2.1. This **Health and Wellbeing Summary Statement** is structured as follows:

- **Section 1 – Introduction** – this section sets out the purpose of the Health and Wellbeing Summary Statement, and provides an overview of the structure. It provides a 'wayfinding' guide to where health has been considered in application documents including Environmental Statement (ES) assessments, management plans and other documents.

Section 1 also provides a background to the Applicant's approach to consideration of health pathways, determinants and populations / sub-populations through the scoping, pre-application, consultation phases of this application, in the context of guidance (including IEMA Guidance on Effective Scoping of Human Health **[Ref. 1]** and Determining Significance for Human Health **[Ref. 2]**) around the consideration of health in Environmental Impact Assessment (EIA).

This confirms the Applicant's inherent approach to considering the wider determinants and pathways of human health on 'receptors' (people, including different and disproportionate effects on people depending on their characteristics), in line with industry standard guidance.

- **Section 2 – Health and Wellbeing Policy Context & Evidence Base** – provides an overview of the national and local policy and strategy of relevance to health and wellbeing in the context of the Proposed Development.

  This section then refers to relevant baseline information that informs the location, scale and sensitivity of populations relevant to experiencing health effects, and provides a health-specific baseline not previously included within the ES.

- **Section 3 – Environmental Effects and Health Pathways** – provides a summary of all of the likely significant (moderate and above) and minor significance effects reported within the ES, and describes them in terms of their relevance to health in-line with guidance. This section identifies how mitigation has been considered within the assessment to avoid or reduce significant effects, where practicable.

- **Section 4 – In-Combination and Cumulative Effects** – provides a summary of all of the likely significant (moderate and above) and minor significance in-combination and cumulative effects reported within the ES, and describes them in terms of their relevance to health in-line with guidance – this includes a consideration of the in-combination effects on Public Rights of Way (PRoW) users, which was not previously included within a single location in the ES.

- **Section 5 – Commentary on Mental Health and Wellbeing –** provides contextual information on the Applicant's consideration of significant mental health and wellbeing effects determinants, pathways and receptors in particular, and identifies the measures undertaken to address them within the Proposed Development and DCO Application.

1.3. Wayfinding

1.3.1. This **Health and Wellbeing Summary Statement** combines conclusions from ES Chapters, Management Plans and other DCO Documents on how the project will influence health, including changes to social, economic and physical environment.

1.3.2. The following documents within the DCO Application are drawn upon within this Statement:

ES Assessments:

- **Volume 1, Chapter 5: Approach to the EIA [EN10158/APP/6.2];**
- **Volume 2, Chapter 6: Air Quality [EN10158/APP/6.2];**
- **Volume 2, Chapter 10: Landscape and Visual [EN10158/APP/6.2];**
- **Volume 2, Chapter 11 Land and Groundwater [EN10158/APP/6.2];**
- **Volume 2, Chapter 13: Noise and Vibration [EN10158/APP/6.2];**
- **Volume 2, Chapter 14: Population [EN10158/APP/6.2];**
- **Volume 2, Chapter 15: Transport and Access [EN10158/APP/6.2];**
- **Volume 2, Chapter 16: Water [EN10158/APP/6.2];**
- **Volume 2 Chapter 17: Cumulative Effects [EN10158/APP/6.2];**
- **Volume 4, Appendix 5.4: Glint and Glare Assessment [EN010158/APP/6.4];**
- **Volume 4, Appendix 5.6: Electromagnetic Field (EMF) Assessment [EN010158/APP/6.4];**
- **Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4];**

Non-ES and Supporting ES Assessments:

- **Outline Drainage Strategy [EN010158/APP/7.11];**
- **Equality Impact Assessment [EN10158/APP/7.12];** and
- **BESS Plume Assessment Summary [EN10158/APP/7.13].**

Management Plans, Mitigation and Control Documents:

1.3.3. These plans have been directly influenced by the assessment of likely significant effects, and through the application of good design and practice to avoid, reduce or monitor and manage environmental effects with an inherent and specific consideration of the health implications on populations and sub-populations of those environmental effects.

1.3.4. These plans and strategies include the design and implementation of tangible measures to physically mitigate effects.

1.3.5. Importantly, they also include the provision of information to affected communities and users of the accessible natural environment, and opportunities for engagement and feedback to ensure that people are able to gain information and review the approach to be taken by the Applicant,

which is considered an important factor to reducing the potential for adverse mental health and wellbeing effects.

- **Design Commitments [EN010158/APP/5.9];**
- **Outline Construction Environmental Management Plan (CEMP) [EN010158/APP/7.2].** Within the Outline CEMP, mitigation on various topics within **ES Volume 2 [EN010158/APP/6.2]** of relevance to human health can be found at the following:
  - Air Quality – Table 3.1;
  - Climate – Table 3.3;
  - Landscape and Visual – Table 3.5;
  - Land and groundwater – Table 3.6;
  - Noise and Vibration – Table 3.8;
  - Water – Table 3.9; and
  - Soil – Table 3.7.
- **Outline Construction Traffic Management Plan (CTMP) [EN010158/APP/7.5];**
- **Outline Landscape and Ecological Management Plan (LEMP) [EN010158/APP/7.6];**
- **Outline Operational Environmental Management Plan (OEMP) [EN010158/APP/7.3]**. Mitigation on various topics within **ES Volume 2 [EN010158/APP/6.2]** of relevance to human health can be found at the following:
  - Air Quality – Table 3.1;
  - Biodiversity – Table 3.2;
  - Climate – Table 3.3;
  - Land and groundwater – Table 3.5;
  - Noise and Vibration – Table 3.7;
  - Water – Table 3.8; and
  - Soil – Table 3.6
- **Outline Soil Management Plan (SMP) [EN010158/APP/7.7]**
- **Outline Rights of Way and Access Strategy (RoWAS) [EN010158/APP/7.8]**
- **Outline Decommissioning Environmental Management Plan (DEMP) [EN010158/APP/7.4]**. Mitigation on various topics within ES Volume 2 of relevance to human health can be found at the following:
  - Air Quality – Table 3.1;

- Biodiversity – Table 3.2;
- Climate – Table 3.3;
- Landscape and visual – Table 3.5;
- Land and groundwater – Table 3.6;
- Noise and Vibration – Table 3.8; and
- Water – Table 3.9; and
- Soil – Table 3.7.

- **Outline Battery Safety Management Plan (BSMP) [EN010158/APP/7.9];** and
- **Outline Employment, Skills and Supply Chain Plan (ESSCP) [EN010158/APP/7.14]**.

Other Documents:

1. **Consultation Report [EN010158/APP/5.1] (including appendices);** and
2. **Design Approach Document [EN010158/APP/5.8].**

1.4. Health Determinants and Pathways

1.4.1. Mental and physical health[1] and wellbeing is influenced by a combination of biological and environmental factors. Biological factors are largely inherent. However, environmental factors can be influenced through design and management of development which may be able to impact on health outcomes.

1.4.2. An ever-growing body of research indicates that the environment in which we live is inextricably linked to our health, and whilst the causal links between development and health are often complex, research consistently reports that most health outcomes are influenced by factors other than genetics and healthcare [**Ref. 4**]. For example, the design of development can influence physical activity levels, travel patterns, social connectivity and mental and physical health outcomes.

1.4.3. These are recognised as the 'wider determinants of health' and include the following (as defined by the WHO and used by guidance such as that published by the Institute of Environmental Management and Assessment (IEMA) [**Ref. 1 and Ref. 2**] and Healthy Urban Development Unit (HUDU) [**Ref. 5**]) – see **Table 1.**

[1] The World Health Organisation (WHO) [**Ref. 3**] defines health as a state of complete physical, mental and social well-being, and not the absence of disease or infirmity

Table 1 - Wider Determinants of Health (WHO)

Categories	Wider Determinants of Health
Health Related Behaviours	Physical activity
	Risk taking behaviours
	Diet and nutrition and access to healthy food
Social Environment	Housing, including design and affordability
	Relocation
	Access to open space, nature leisure and play
	Transport modes, accessibility, active travel and connections
	Community safety and crime
	Community identity, culture, resilience and influence
	Social participation, cohesion, interaction and support
	Access to health and social care services and other social infrastructure
Economic Environment	Education and training
	Employment and income
Bio-physical Environment	Climate change and adaption
	Air quality
	Water quality or availability
	Land quality
	Noise and vibration
	Radiation
Institutional and built environment	Health and social care services
	Built environment
	Wider societal infrastructure and resources

1.4.4. To determine potential health impacts, health pathways are identified. Health pathways are the mechanisms through which planning and development can affect health.

1.4.5. These are informed by an extensive literature review including the Marmot Review into Health Inequalities [**Ref. 6**], Public Health England's Spatial Planning for Health evidence resource [**Ref. 4**] and the Environment Agency's scoping the environmental impacts of carbon capture, transport and storage guidance [**Ref. 7**].

1.4.6. Health pathways provide a qualitative approach to understand the potential effects. Health pathways do not produce predictable or equal health effects in individuals. When exposed to the same health pathway, different individuals may react differently as a result of a complex mixture of underlying levels of health, lifestyle factors and personal preferences and therefore aggregation at a population level is necessarily qualitative.

1.4.7. The Applicant has reviewed the above determinants and pathways, and concluded that – where relevant to the Proposed Development – these have been considered, assessed and mitigated within the DCO Application documents listed above ('Wayfinding').

2. Health & Wellbeing Policy Context & Evidence Base

2.1. National Policy

Overarching National Policy Statement for Energy (NPS EN-1)

2.1.1. Overarching National Policy Statement for Energy (NPS EN-1) (2023) [**Ref. 8**] highlights the matters that need to be considered in relation to impacts on health and wellbeing, with the construction of energy infrastructure and the production, distribution and use of energy having the potential to impact some people's lives in a negative manner.

2.1.2. It sets out that direct health impacts that may arise as a result of new energy infrastructure include increased traffic, air or water pollution, dust/odour, hazardous waste, exposure to radiation and an increase in pests, as well as changes to the composition and size of the local population which could have indirect health impacts on public services, transport and the use of open space.

2.1.3. NPS EN-1 (Paragraph 4.4.4) goes on to state that where development has the potential to affect human beings, the ES should assess those effects for each element of the project, identifying any adverse health impacts and measures to avoid, reduce, or compensate for the impacts as appropriate.

2.1.4. Paragraph 4.4.7 of NPS EN-1 advises that the aspects of energy infrastructure which are "*most likely to have a significantly detrimental impact on health are subject to separate regulation (for example air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either by themselves constitute a reason to refuse consent or require specific mitigation*".

National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)

2.1.5. This National Policy Statement (NPS EN-3) (2023) **[Ref. 9]** sets various requirements that a development is expected to meet in order to progress through the planning process and gain consent from the Planning Inspectorate. These include several aspects that are relevant to determinants and pathways for health effects including PRoW and access, design and visual amenity and agriculture.

National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)

2.1.6. This National Policy Statement (NPS EN-5) (2023) [**Ref. 10**] was drafted to support the transition to clean power by 2030 and to ensure the security and reliability of the UK's electricity supply.

2.1.7. When looking at components of the policy statement of relevance to health, the policy highlights the direct and indirect EMFs can have on human health, aquatic and terrestrial organisms. In order to prevent these effects, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) created health protection guidelines to protect the public and occupational workers from exposure. All new electricity infrastructure is expected to comply with these guidelines.

National Planning Policy Framework (NPPF)

2.1.8. The National Planning Policy Framework (NPPF) **[Ref. 11]** sets out the governments planning policies for England. Chapter 8 'Promoting Healthy and Safe Communities' sets out a planning policy framework of direct relevance to human health, emphasising that planning and development should aim to 'achieve healthy, inclusive and safe places'.

2.2. Local Planning Policy & Community Strategy

Buckinghamshire Council Corporate Plan

2.2.1. The Buckinghamshire Council Corporate Plan **[Ref. 12]** highlights the council's overarching objectives around making Buckinghamshire the best place to live, raise a family, work and do business by increasing prosperity, strengthening communities, improving the environment and protecting the vulnerable.

2.2.2. In order to strengthen communities, Buckinghamshire Council are committed to improving health and wellbeing with a particular focus on reducing any gap in health outcomes. In addition, Buckinghamshire Council are also dedicated to ensuring that families feel safe and supported, and that disabled and vulnerable people receive the right support at the right time. When looking at improvements to the environment, the corporate plans also highlight Buckinghamshire Councils ambitions to address climate change by creating economic opportunities for clean growth and to improve air quality by reducing carbon emissions.

Buckinghamshire Draft Joint Local Health and Wellbeing Strategy

2.2.3. The Draft Buckinghamshire Joint Local Health and Wellbeing Strategy **[Ref. 13]** sets out the aims and strategic direction that Buckinghamshire Council have committed to take between 2025 and 2035 to ensure that health and wellbeing within Buckinghamshire is improved, and that health inequalities are reduced. The main areas of focus highlighted within this strategy are based around reducing health inequalities, improving population health and ensuring the sustainability of services.

2.2.4. In order to realise Buckinghamshire Councils vision and deliver against the council's ambitions, the following strategic priorities were developed:

- working with people and communities to empower them to live active and fulfilling lives, with a focus on the wider determinants of health such as housing, employment and education;
- having a greater emphasis on preventing illness and encouraging independence so that people can live healthier and more independent lives; and
- working to identify and support people with needs to prevent escalation of their condition or decline of their overall health and wellbeing.

Vale of Aylesbury Local Plan

2.2.5. The Vale of Aylesbury Local Plan **[Ref. 14]** can be defined as the cornerstone of planning for the whole plan area which is critical to delivering national, community and corporate objectives.

2.2.6. The vision set out within the Local Plan suggests that Aylesbury Vale will see a sustainable amount and distribution of growth in order to meet the area's needs, contributing to the creation of a thriving, diverse, safe and vibrant place to live, work and visit. In order for this growth to occur, the economy will be more competitive and innovative, while growth will also be accompanied with the delivery of infrastructure, services and facilities to bring maximum benefits to new/existing communities.

2.2.7. Strategic objectives of direct relevance to human health include:

- Making provision for balanced sustainable growth which will deliver new housing and jobs to meet the needs of new and existing residents through a flexible and pro-active approach to promoting sustainable development;
- Working with partners to secure the timely and well-located provision of infrastructure, services and facilities to sustain and enhance existing and new communities (including education, training and community facilities, accessible green infrastructure and associated sport and recreational facilities, and social care and health infrastructure);
- Managing development in a way that ensures the protection and enhancement of Aylesbury Vale's built, natural and historic environment, landscape and biodiversity;
- Managing development in a way that ensures that climate change is mitigate against, including making appropriate provision for the generation and use of renewable or low-carbon energy; and
- Promoting the provision of measures that strengthen the quality of life for new and existing residents of Aylesbury Vale, while addressing pockets of health deprivation and health inequalities within the area.

2.2.8. Policies of particular relevance to human health are as follows:

- S1 ‘Sustainable development for Aylesbury Vale’;
- T7 ‘Footpaths and cycle routes’;
- BE3 ‘Protection of amenity of residents’;
- NE1 ‘Biodiversity and Geodiversity’;
- NE5 ‘Pollution, air quality and contaminated land’;
- NE6 ‘Local green space’;
- C3 ‘Renewable Energy’;
- C4 ‘Protection of public rights of way’; and
- I3 ‘Community facilities, infrastructure and assets of community value’.

Buckinghamshire Rights of Way Improvement Plan (2020 to 2030)

2.2.9. The Buckinghamshire Rights of Way Improvement Plan **[Ref. 15]** sets out the council’s priorities for improving PRoW for both residents and visitors. The plan also highlights the fact that public rights of way support better health and wellbeing by providing places for people to exercise. In addition to this, the plan also suggests that walking and cycling can assist in reducing harmful effects (e.g. air pollution from traffic) and improving the overall health of the local population.

2.2.10. The promotion and improvement of rights of way within Buckinghamshire can lead to improvements in areas of poorer health (e.g. areas with high child obesity), address health inequalities through improving access to the natural environment and create better places that support health and wellbeing.

2.2.11. This report sets out the approach to the assessment of significant effects of the Project, on human health receptors. This report does not follow the same format as a typical ‘Human Health’ Chapter that would form part of an Environmental Statement, but serves the primary purpose of bringing together all parts of the current application that are of relevance to health and wellbeing.

Buckinghamshire Vision

2.2.12. The Buckinghamshire Vision **[Ref. 16]** sets out the measures that need to be taken in order to ensure that Buckinghamshire will grow as a *‘thriving, resilient and successful county’*, where both *‘residents and businesses can reach their best potential, growth is delivered sustainably to support meeting net zero and environmental enhancement is achieved to support a high quality of life for our communities’*.

2.2.13. Buckinghamshire Council are committed to having a clear and collaborative future vision in order to address the various challenges that

the area is currently facing which include pressures on the natural environment, spatial concentrations of health inequalities, the challenges of an ageing population on public services and areas of deprivation with high levels of unemployment.

2.2.14. As a result of this, the council are committed to protecting and enhancing the natural environment, ensuring that health inequalities are reduced and mental health is improved, and ensuring that Buckinghamshire is a safe, healthy and prosperous location.

2.2.15. The three main objectives of the plan are set out below, in addition to the components of these objectives that are of direct relevance to human health:

- **Successful businesses and careers** – ensuring that Buckinghamshire is resilient and adaptable, while ensuring that every business across the county has a chance to succeed and supporting and improving the physical and mental health of the workforce as a vital backbone to economic performance;
- **Thriving culture, heritage and natural environment** –tackling impacts of climate change to achieve net zero by 2050, increasing the use of sustainable resources and supporting the development of renewable energy generation, in addition to supporting active lifestyles and good physical and mental health by making it easier for local residents to access clean air, natural spaces and food growing areas; and
- **Vibrant and connected places** – creating a 'Buckinghamshire' where residents are able to live independent, healthy and connected lives in vibrant, low-carbon places, by tackling social exclusion, health inequalities and areas of deprivation to enhance digital/physical connectivity, promoting walking and cycling as the first choice for local journeys, and improving opportunities for sport and leisure to support mental health and encourage healthy behaviours.

The Local Plan for Buckinghamshire – Draft Vision and Objectives

2.2.16. The Draft Vision and Objectives Local Plan document published by Buckinghamshire Council **[Ref. 17]** sets out what Buckinghamshire Council want the local plan to achieve, covering climate change, the natural environment, housing, infrastructure and how Buckinghamshire connects to other places.

2.2.17. The overarching vision for Buckinghamshire in 2040 references aims of ensuring that Buckinghamshire is "mitigating and adapting to" climate change, increasing the provision of active and sustainable opportunities and encouraging the delivery of new renewable energy schemes to reduce harmful emissions.

2.2.18. Objectives of direct relevance to human health set out within this document are as follows:

- **Natural and built environment** – conserving/enhancing Buckinghamshire's value natural, historic and built environment by conserving/enhancing special places for nature and creating a county-wide network of green and blue infrastructure;
- **Mitigating/adapting to climate change** – ensuring the delivery of sustainable development and mitigating against climate change by increasing the supply of renewable/low-carbon energy and providing attractive and viable alternative to the private car;
- **Quality of place** – creating great places to live and work that are safe and accessible to all which will include securing a robust network of spaces across Buckinghamshire that for recreation, play, biodiversity and water infrastructure, connecting to the rights of way network;
- **Community health and wellbeing** – improving health care facilities and access to these facilities, while supporting physical/mental health and social/cultural wellbeing by supporting active lifestyles and good health through people-friendly streets and open spaces, ensuring that local health facilities are accessible and of a good standard, providing new/enhanced sports, leisure and cultural facilities and improving Air Quality Management Areas (AQMAs);
- **Infrastructure** – ensuring that the right infrastructure is provided at the right time which will include providing appropriate social infrastructure for health, education, skills training, sports and recreation, connecting blue and green infrastructure to enhance biodiversity and the creation of safe and vibrant public spaces; and
- **Transport, physical and digital connectivity** – improving connectivity between Buckinghamshire's towns and villages through the creation of safe and attractive walking and cycling routes and delivering low or zero carbon fuel infrastructure through new development.

Buckinghamshire Healthy Ageing Strategy

2.2.19. The Buckinghamshire Healthy Ageing Strategy **[Ref. 18]** highlights the council's commitments to becoming more 'age-friendly', with the three central outcome measures for this strategy being ensuring that people over the age of 65 spend more of their lives in good health, getting more people over the age of 65 into work and ensuring that fewer adults feel lonely and isolated.

2.2.20. Aims across the age friendly Buckinghamshire themes that are of direct relevance to human health are as follows:

- creating high quality, accessible, social and safe public spaces;

- promoting accessible, affordable and appropriate travel options;
- reducing and removing barriers to participation to foster engagement with activities/events to create a sense of belonging;
- strengthening the health and wellbeing of communities, while supporting the network of community-based groups; and
- supporting people from all backgrounds to age well with respect and dignity.

Sustainable Community Strategy for Buckinghamshire

2.2.21. The Buckinghamshire Sustainable Community Strategy [**Ref. 19**] sets out the shared partnership vision for Buckinghamshire up until 2026, with the Bucks Strategic Partnership having aims of transforming Buckinghamshire into a "economically prosperous" area where all communities can enjoy a high quality of life and an enhanced local environment.

2.2.22. The strategy sets out various broad themes/outcomes, with the outcomes of relevance to human health summarised below:

- Sustainable Environment – tackling climate change, enhancing and protecting the local environment, reducing waste and managing the transport network;
- Safe Communities – reducing crime and the fear of crime, reducing the harm caused by alcohol and drugs, improving the safety of local people and promoting safe development;
- Health and Wellbeing – promoting healthy lifestyles, reducing health inequalities, improving quality of life for the children and young people as well as the ageing population and creating well-connected communities; and
- Cohesive and Strong Communities – increasing the confidence of communities and reducing levels of disadvantage.

2.3. Local Health Priorities

Buckinghamshire Joint Strategic Needs Assessment (JSNA) and Buckinghamshire Joint Health and Wellbeing Strategy

2.3.1. The JSNA **[Ref. 20]** provides a snapshot of the current and future health care needs of the local population in Buckinghamshire County.

2.3.2. Buckinghamshire's Joint Health and Wellbeing Strategy **[Ref. 21]** enables the Health and Wellbeing Board to champion the shared ambitions and aims while setting out the various actions that need to be taken in order to improve health and wellbeing for Buckinghamshire residents and reduce health inequalities.

2.3.3. Key priority areas that were identified as part of the health and wellbeing strategy include:

- Starting well – improving outcomes during maternity and early years, improving mental health support for children and young people and reducing the prevalence of obesity;
- Living well – reducing rates of cardiovascular disease, improving mental health support for adults and reducing obesity in adults; and
- Ageing well – improving places and helping communities support healthy ageing, improving mental health support and reducing feelings of social isolation for older people, and increasing physical activity amongst older people.

2.4. Neighbourhood Plans

Steeple Claydon Neighbourhood Plan

2.4.1. Steeple Claydon Neighbourhood Plan **[Ref. 22]** includes specific community objectives of relevance to human health are as follows:

- To encourage development which addresses local housing and community infrastructure needs; and
- To protect and enhance community assets (facilities, buildings and green spaces).

2.4.2. Policy SC1 ‘Steeple Claydon Settlement Boundary’ suggests that development proposals on land outside the settlement boundary will not be permitted unless they support sustainable growth and expansion of business or enterprise within the countryside or support sustainable rural tourism or leisure development that benefits businesses, communities and visitors of the countryside area.

Quainton Neighbourhood Plan

2.4.3. Quainton Neighbourhood Plan **[Ref. 23]** sets an overarching vision based around creating a “thriving community-based village with a treasured rich heritage where people can fulfil their ambitions for home, work and leisure in a safe, friendly and rural environment”.

2.4.4. The Neighbourhood Plan includes specific community objectives of relevance to human health are as follows:

- Balancing growth with the need to protect the village environment;
- Protecting the rural landscape, particularly green spaces, footpaths, bridle paths, recreation areas and important viewpoints; and
- Promoting biodiversity and protecting flora and fauna.

Winslow Neighbourhood Plan

2.4.5. Winslow Neighbourhood Plan **[Ref. 24]** sets an overarching vision of making Winslow *"a more sustainable town that is increasingly able to meet its own needs for housing, jobs, community facilities and public and commercial services"*.

2.4.6. An objective within the Neighbourhood Plan that is of direct relevance to human health is based around encouraging the greater use of walking, cycling and public transport.

2.4.7. Policy 11 'Traffic, Transport, Cycle Routes and Parking' suggest that cycle routes should be incorporated as integral design features within major new developments in order to create useful and effective links for cyclists and pedestrians.

Calvert Green Neighbourhood Plan

2.4.8. Calvert Green Neighbourhood Plan **[Ref. 25]** sets an overarching vision which is based around making sure that Calvert Green remains a *"safe, healthy, clean and caring place that people want to live in for the long term".*

2.5. Health Baseline and Context

2.5.1. In line with IEMA Guidance this **Health and Wellbeing Summary Statement** focuses on significant residual adverse effects identified through the EIA process which could have an impact on human health at a population level and, if relevant, a sub-population level (and not an individual level).

2.5.2. It is important to note that the **Health and Wellbeing Summary Statement** does not seek to repeat baseline data presented elsewhere within the ES, but considers the baseline information within these ES assessments that is of relevance to health and wellbeing.

2.5.3. Sub-populations(s) are identified in the IEMA guidance as those with vulnerability due to:

- Young age;
- Older age;
- Income or unemployment;
- Health status;
- Social disadvantage; and
- Access or geographic factors.

2.5.4. Where these relate to Protected Characteristics under the Equality Act, they are referred to in the baseline section of the **Equality Impact Assessment [EN010158/APP/7.12].**

2.5.5. Otherwise, the baseline section of **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** considers the demographic and economic context of study areas in line with the above sub-population characteristics, with Buckinghamshire recording a higher proportion of retired residents than the national average and generally and older and ageing population.

2.5.6. Baseline data presented in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** also indicates that the proportion of individuals who are economically inactive due to long-term sickness or disability is lower in Buckinghamshire than the regional and national averages, indicating there would be limited disproportionate effects on this group.

2.5.7. In addition to the baseline information in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]**, the following section sets out health-specific baseline information that helps to identify the sensitivity of populations to environmental, economic and social changes that may have the potential to influence health pathways.

2.5.8. In general, populations and sub-populations are considered to have greater **sensitivity** if they experience higher levels of deprivation and wider pre-existing health inequalities, shared resources, higher levels of anxiety, uncertainty or concern relating to an intervention, and poor health indicators with an overall limited capacity to adapt to change.

2.5.9. **Tables 2 and 3** provide a health summary to identify local health priorities. Most data is drawn from Office for Health Improvement and Disparities (OHID) Public Health Profiles [**Ref. 26**], supported by ONS and 2021 Census data [**Ref. 27**].

2.5.10. For the purposes of this baseline, a local ward area has been identified which includes the areas that the Order Limits falls within. These ward areas are based on the 2021 Census and are as follows:

- Great Brickhill;
- Grendon Underwood; and
- Winslow.

Table 2 – Health Profile Summary (Green = Better than England average; Yellow = Equal with England average; Red = Worse than England average)

Health Indicator		Great Brickhill	Grendon Underwood	Winslow	Buckingham shire	South East	England
Health Outcomes							
Life Expectancy at Birth (years) 1-year range (2023)	Male	n/a	n/a	n/a	81.5	80.5	79.3
	Female	n/a	n/a	n/a	85.4	84.3	83.2
Inequality in life expectancy at birth (years) 3-year range (2021-2023)	Male	n/a	n/a	n/a	8.2	8.5	10.5
	Female	n/a	n/a	n/a	6.2	6.6	8.3
Under 75 mortality rate from all causes considered preventable 1-year range (2023)	Directly standardised rate per 100,000	n/a	n/a	n/a	117.7	138.2	163.7
Under 75 mortality rate from cardiovascular disease (2023)	Directly standardised rate per 100,000	n/a	n/a	n/a	59.0	62.1	77.4
Under 75 mortality rate from cancer (2023)	Directly standardised rate per 100,000	n/a	n/a	n/a	99.2	111.7	120.8

Health Indicator		Great Brickhill	Grendon Underwood	Winslow	Buckingham shire	South East	England
Under 75 mortality rate from respiratory disease (2023)	Directly standardised rate per 100,000	n/a	n/a	25.1	23.6	27.7	33.7
Suicide rate, directly standardised rate per 100,000 population (2021-23)		n/a	n/a	13.1	10.3	10.4	10.7
Depression: QOF prevalence - retired after 2022/23		n/a	n/a	12.6%	12.7%	13.8%	13.2%
Emergency hospital admissions for coronary heart disease, standardised admission ratio (2016/17 – 2020/21)		74.9	68.5	72.9	72.2	-	100.0
Emergency hospital admissions for myocardial infarction (heart attack), standardised admission ratio (2016/17 – 2020/21)		85.7	74.6	72.3	86.8	-	100.0
Emergency hospital admissions for intentional self-harm, standardised admission ratio (2016/17 - 2020/21)		22.4	77.6	64.0	80.2	-	100.0
Utilisation of outdoor space for exercise or health reasons (March 2015)		n/a	n/a	n/a	17.4	18.2	17.9
Percentage of adults meeting the '5-a-day' fruit and vegetable consumption recommendations (new method) (2023/24) (Persons, 16+ years)		n/a	n/a	n/a	36.5%	34.6%	31.3%

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckingham shire	South East	England
Risk Factors						
Excess weight in adults (2022/23) (percentage of adults aged 18 years over classified as overweight or obese)	n/a	n/a	n/a	65.9%	63.2%	64.5%
Excess weight (overweight and obese) prevalence in children (3 years data combined from 2021/2022 - 2023/2024) in Year 6	27.8%	31.3%	28.6%	30.9%	33.2%	36.7%
Excess weight (overweight and obese) prevalence in children (3 years data combined from 2021/2022 - 2023/2024) in Reception	18.6%	22.7%	22.4%	18.4%	20.4%	21.9%
Percentage of physically active adults (2022/23)	n/a	n/a	n/a	73.7%	70.5%	67.4%
Percentage of physically active children and young people (2023/24)	n/a	n/a	n/a	51.9%	48.2%	47.8%
Wider Determinants						
Proportion living in fuel poverty (low income, low energy efficiency methodology) (2022)	n/a	n/a	n/a	8.5%	9.7%	13.1%
Percentage of households in fuel poverty (2020)	7.7%	7.8%	7.5%	7.3%	-	13.2%
Winter mortality index (%) (August 2021)	n/a	n/a	n/a	10.4%	8.6%	8.1%

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckingham shire	South East	England
Child poverty, income deprivation affecting children index (IDACI) (2019) (%)	5.0%	5.1%	6.6%	8.5%	-	17.1%
Older people in poverty, income deprivation affecting older people Index (IDAOPI) (2019) (%)	6.6%	6.2%	8.0%	7.7%	-	14.2%
Children in low income families (all dependent children under 20) (2016)	n/a	n/a	n/a	9.4%	16.3%	17.0%
16 to 17 year olds not in education, employment or training (NEET) or whose activity is not known (2022/23)	n/a	n/a	-	7.0%	6.8%	5.4%
19 to 24 year olds not in education, employment or training (%) (2021)	n/a	n/a	n/a	n/a	11.8%	13.2%
Percentage of people in employment (%) (2023/24)	n/a	n/a	n/a	81.2%	79.6%	75.7%
Average attainment 8 score (2022/23)	n/a	n/a	n/a	52.2	47.3	46.2
Violent Crime (violent offenses per 1,000 population) (2023/24)	n/a	n/a	19.1	21.5	29.7	32.7
Number of people reported killed or seriously injured (KSI) on the roads, (per billion vehicle miles) (2023)	n/a	n/a	n/a	56.8	89.8	91.9
Pollution: fine particulate matter (concentration of PM2.5) (2023)	n/a	n/a	n/a	7	6.7	7

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckingham shire	South East	England
Fraction of mortality attributable to particulate air pollution (2023)	n/a	n/a	n/a	5.3%	5.1%	5.2%
The percentage of the population exposed to road, rail and air transport noise of 65dB(A) or more during daytime (2021)	n/a	n/a	n/a	3.2%	3.0%	4.3%
The percentage of the population exposed to road, rail and air transport noise of 55dB(A) or more during the night-time (2021)	n/a	n/a	n/a	6.4%	6.5%	8.4%
The rate of complaints about noise (per 1,000 population) (2023/24)	n/a	n/a	n/a	1.2	4.2	5.9

Source: OHID (2025)

Table 3 – Self-Reported Health Summary (Green = Better than England average; Yellow = Equal with England average; Red = Worse than England average)

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Self-Reported General Health (Census 2021)						
'Very Good' and 'Good'	86%	86%	86%	86%	84%	82%
'Fair'	10%	11%	11%	10%	12%	13%
'Bad' and 'Very Bad'	3%	3%	3%	3%	4%	5%
Self-Reported General Health (Census 2021)						
Day-to-day activities limited a little	9%	9%	10%	9%	10%	10%
Day-to-day activities limited a lot	5%	5%	5%	5%	6%	7%

Health Outcomes

2.5.11. Data from OHID Public Health Profiles [**Ref. 26**] on life expectancies presented in **Table 2** are collected from 2023. This data is currently not available at the ward level. Life expectancy at birth for men in Buckinghamshire (81.5 years) is recorded to be greater than rates across the South East (80.5) and England (79.3). When looking at females, Buckinghamshire was also recorded to have the highest life expectancy when compared to regional and national averages.

2.5.12. The 2021 Census [**Ref. 27**] asked residents to self-assess their health, and the results suggest that residents in Great Brickhill, Grendon Underwood, Winslow and Buckinghamshire have a better self-perceived health (with 86% of residents reporting health to be 'very good' or 'good') than both the South East region and England.

2.5.13. Data from the 2021 Census [**Ref. 27**] on disability suggests that the local ward areas and Buckinghamshire are all recorded to have a lower proportion of individuals that have their day-to-day activities limited as a result of a disability or long-term health problem.

Risk Factors

2.5.14. The evidence base for the Buckinghamshire Joint Needs Assessment includes the Joint Local Health and Wellbeing Strategy 2025 – 2035 (DRAFT) [**Ref. 13**]. The Strategy sets out the aims and priorities in terms of local health, which focus on making a visible difference to health outcomes and reducing inequalities across the county, while putting residents at the heart of the actions.

2.5.15. There are three priority action areas: Start well, Live well and Age well. Particular emphasis is placed on improving mental health support for all age-groups: children, young people, working-age people and the elderly, reducing prevalence of obesity, rates of cardiovascular disease and improving places and helping communities to support healthy aging.

2.5.16. The prevalence of excess weight within year 6 children was lower in the Local Ward areas and Buckinghamshire when compared to regional and national proportions. Conversely, the prevalence of excess weight within both Grendon Underwood and Winslow is higher than both the regional and national averages, highlighting the current obesity issues that the local area faces.

2.5.17. Prevalence of overweight and obesity in adults is higher within Buckinghamshire (65.9%) when compared to proportions in the South East (63.2%) and England (64.5). Significant inequalities exist across the county, with a disproportionate number of those living in the more deprived communities more likely to be affected by obesity.

2.5.18. Data from the Department of Health and Social Care [**Ref. 26**] suggests that that the proportions of individuals partaking in physical activity in Buckinghamshire (73.7%) are higher than the proportion at the regional (70.5%) and national level (67.4%).

Mental Health

2.5.19. Mental health and physical health are intricately linked: poor physical health can cause mental health problems and vice versa. Those that suffer from obesity, substance misuse, smoking, cancer and cardiovascular disease are particularly likely to also have a mental health problem.

2.5.20. Having a chronic physical condition was also associated with having a lower level of mental wellbeing. Chronic health conditions (including asthma, cancer, high blood pressure) have a strong association with mental ill-health [**Ref. 28**]. In people with severe “common medical disorders (CMD)”, 37% reported a chronic physical condition [**Ref. 28**].

2.5.21. Improving mental health has also been identified as a priority within the Buckinghamshire Joint Local Health and Wellbeing Strategy [**Ref. 13**], with the strategy highlighting the need to address mental health inequalities.

2.5.22. Suicide is a significant cause of death in young adults (when considering the overall mortality rate of this group) and is an indicator of underlying rates of mental ill-health. Suicide rates within Buckinghamshire are similar to the regional and national levels at 10.3 per 100,000 population.

2.5.23. Prevalence of depression within Buckinghamshire (12.7%) is slightly lower than the regional (13.8%) and national levels (13.2%). Data on personal wellbeing from the ONS [**Ref. 29**] also indicates that the wellbeing levels including life satisfaction, happiness and the feeling that living is worthwhile are higher in Buckinghamshire than the regional and national averages, while anxiety levels are slightly higher than the national average.

2.5.24. Data from OHID Health Profiles suggests that the standardised ratio of emergency hospital admissions for intentional self-harm is lower in Buckinghamshire when compared to the national average. Regarding the local population, the rate of emergency hospital admissions for intentional self-harm, as a general indicator relevant to mental health, is also significantly lower across local three wards when compared to the national level.

2.5.25. Data from the 2021 Census [**Ref. 27**] suggests that the percentage of people who cannot speak English well or at all is lower within the local wards and Buckinghamshire when compared to the national average.

Air Quality

2.5.26. Poor air quality and air pollution can be recognised as contributing factors towards cancer, heart disease, increases in hospital admissions, exacerbation of asthma and mortality. Air pollution is known to have a particular effect on the elderly population, children, and those with pre-existing health conditions, with air pollution expected to be responsible for a reduction in healthy life expectancy equivalent to 29,000 to 43,00 deaths per year.

2.5.27. Buckinghamshire Council's Air Quality Action Plan (2024 – 2030) [**Ref. 29**] identifies that air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas.

2.5.28. It highlights that Buckinghamshire is committed to reducing the exposure of local people to poor air quality to improve health.

2.5.29. The main source of air pollution in Buckinghamshire is from road transportation. Nitrogen dioxide (NO2) is the major pollutant of concern with nine Air Quality Management Areas (AQMAs) designated by the Council for exceedances of NO2 meaning that air pollution exceeds the national norms.

2.5.30. When looking at the site specific population, emergency hospital admissions for coronary heart disease and myocardial infarction (heart attack) are all significantly lower within the local wards when compared to regional and national levels, noting that air quality is only one contributing factor to these admissions.

Noise and Vibration

2.5.31. Very high noise levels can have direct impacts on health (hearing loss or tinnitus)[2]. Lower levels (nuisance or annoyance levels) have indirect health effects including through stress-related illness and disturbances in sleep. These nuisance levels do not affect people equally. Nuisance and annoyance can have higher or lower relative importance assigned by those affected by them. Such importance varies within and across

[2] Noise exposure level beyond 80 dB during 40 years of working a 40 hour work week can give rise to permanent hearing impairment. Given that environmental exposure to noise is much lower than these levels and that noise-related hearing impairments are not reversible, the GDG considered that there should be no risk of hearing impairment due to environmental noise and considered any increased risk of hearing impairment relevant. WHO, (2018). Environmental Noise Guidelines for the European Region, p. 23 [**Ref. 30**].

populations, and this importance or variability can be uncertain [**Ref. 30**]. As such it is challenging to predict with any certainty the degree to which nuisance and annoyance from noise will affect people at an individual level.

2.5.32. When looking at environmental health factors, only 3.2% of Buckinghamshire residents were recorded to be exposed to road, rail and air transport noise of 65dB(A) or more during daytime – this was slightly higher than the South East (3.0%) and lower than England average (4.3%).

2.5.33. The rate of complaints per 1,000 population about noise in Buckinghamshire (1.2) is lower than rates at the regional and national levels (4.2 and 5.9, respectively).

Other Wider Determinants

2.5.34. Data from the Department of Health and Social Care [**Ref. 26**] indicates that Buckinghamshire has rates of children in poverty and older people in poverty in comparison to national proportions.

2.5.35. This is also true for rates of children in low income families, with proportions of 9.4% in Buckinghamshire, compared to a higher rates of 16.3% and 17% at the regional and national levels, respectively.

2.5.36. Contrastingly, the proportion of 16 to 17 year olds not in education, employment or training (NEET) or whose activity is not known in 2023/24 was higher in Buckinghamshire (7.0%) than in the South East (6.8%) and England (5.4%). When looking at other socio-economic health outcomes, Buckinghamshire was also recorded to have a higher proportion of residents in employment and a higher average attainment 8 score when compared to the regional and national levels.

2.5.37. The rates of violent offences per 1,000 people in 2023/24 were lower in Buckinghamshire (21.5) when compared to the South East (29.7) and England (32.7). Similarly, the number pf people reported killed or seriously injured on the roads was also lower than the regional and national levels.

Deprivation Associated with Poor Health

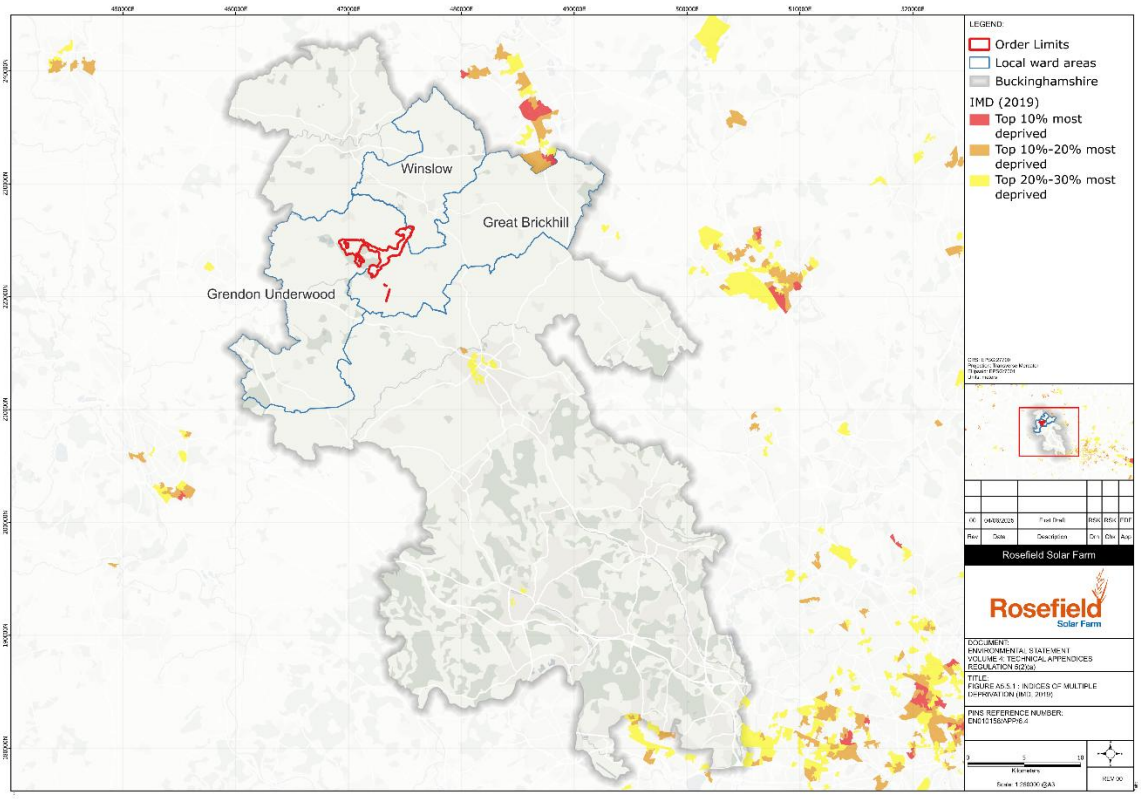
2.5.38. The Government's Index of Multiple Deprivation (IMD) (2019) [**Ref. 31**] measures deprivation by combining a range of social, economic and housing factors, to establish a single deprivation score and rank for each small area (Lower-layer Super Output Area, LSOA) across England. All LSOAs are ranked relative to one another according to their level of deprivation.

2.5.39. There are seven "domains" of deprivation, outlined as follows:

- Income deprivation;
- Employment deprivation;
- Education, skills and training deprivation;
- Health deprivation and disability;
- Crime;
- Barriers to housing services; and
- Living environment deprivation.

2.5.40. IMD (2019) data suggests that deprivation within Buckinghamshire is relatively low but there are pockets of high deprivation (areas ranked within the top 30% of most deprived in the country) in Aylesbury and High Wycombe.

Figure 2.1 – Indices of Multiple Deprivation (IMD, 2019)



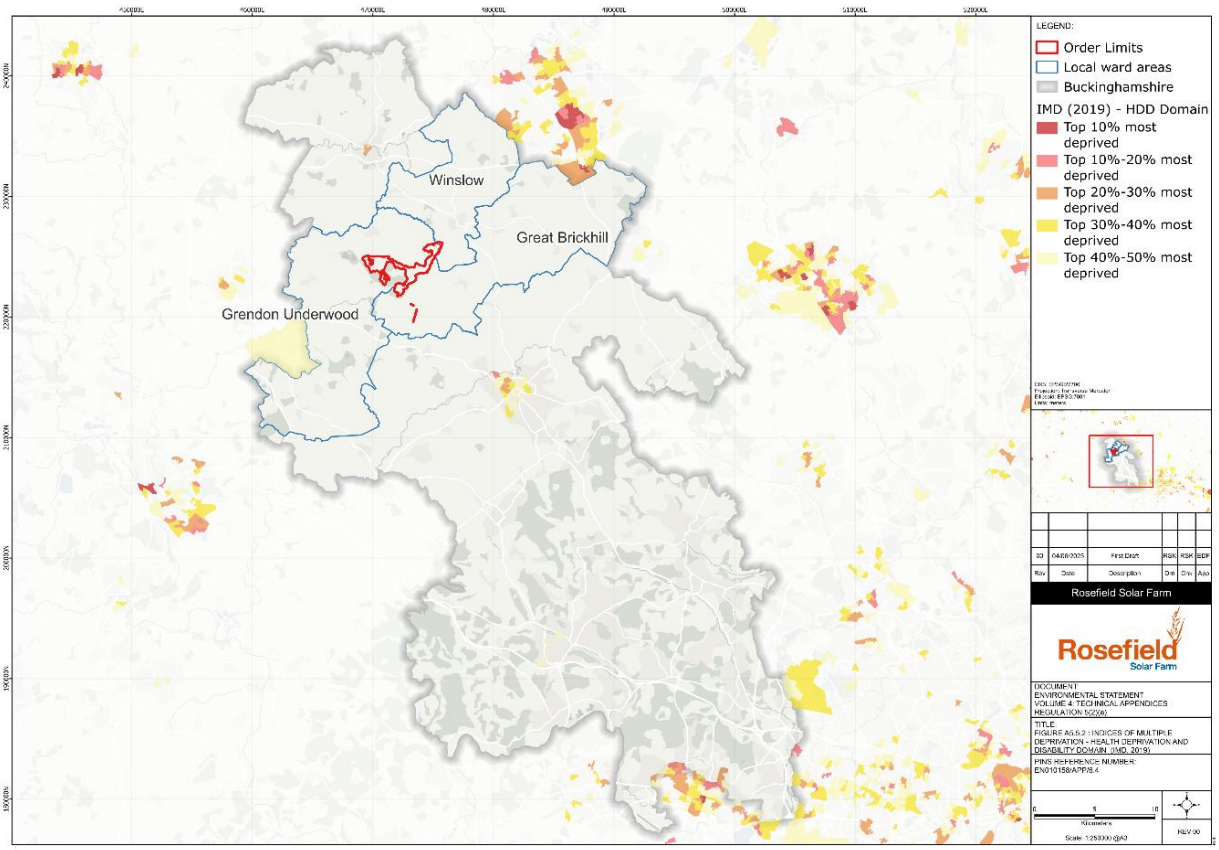
2.5.41. Health deprivation and disability measures *"the risk of premature death and the impairment of quality of life through poor physical or mental health"*. Measures of health include morbidity, disability and premature mortality.

2.5.42. The Site does not fall within the top 30% most deprived areas in England for the Health domain. In fact, there are no LSOA areas within any of the

three local wards to the Site that are within the top 50% of most deprived areas in England – suggesting these areas are all less deprived in terms of health than the average for England.

2.5.43. More widely within Buckinghamshire, there are some pockets of health deprivation within Buckingham, and Aylesbury where there are some LSOAs which fall amongst 20 and 30% most deprived for the health domain.

Figure 2.2 – Indices of Multiple Deprivation – Health Domain (IMD, 2019)



Equality and Sensitivity of Vulnerable Groups

2.5.44. Within a defined population, individuals will range in their levels of sensitivity to health outcomes due to factors such as age, socio-economic deprivation and pre-existing health conditions. It is clear that some groups may be particularly vulnerable to changes whereby they could experience differential or disproportionate effects when compared to the general population.

2.5.45. The **Equality Impact Assessment [EN010158/APP/7.12]** notes that while the defined Local Area (Grendon Underwood and Great Brickhill wards) does not have a particularly sensitive age profile, it is clear that both

younger and older residents may be more affected by the Proposed Development.

2.5.46. This is due to the fact that elderly residents are more likely to be at home during the day and more susceptible to changes in accessibility and air quality, while younger children will have daytime sleep patterns and may have slower reaction times to changes in traffic patterns.

2.5.47. Disability may also influence the sensitivity of a population, for example to changes in environmental amenity and accessibility. The proportion of individuals that were disabled under the Equality Act 2010 and had day to day activities limited was lower in Buckinghamshire when compared to the South East and England averages.

2.6. Conclusion of Health Baseline

2.6.1. Based on the baseline profile and the national, regional and local policy in relation to health, the Applicant has identified that the general population is considered to be of medium sensitivity.

2.6.2. Overall, populations with a higher sensitivity to health effects related to environmental change resulting from the Proposed Development are anticipated to be:

- Children and young people;
- Older people;
- Socially disadvantaged, e.g. low income, those experiencing discrimination;
- People with existing poor health (physical and mental); and
- People with access and geographical factors, e.g. unemployed or shift workers who may spend more time at home.

2.6.3. Based on the baseline profile, and the national, regional and local policy in relation to health, the Applicant has identified the following health priorities:

- Promoting mental health and wellbeing and improving the level of care available for those suffering from mental health issues;
- Tackling inequality across the county;
- Tackling the levels of obesity and related life choices;
- Working to prevent long-term health conditions such as cardiovascular disease.

3. Environmental Effects and Health Pathways

3.1. Outline of Approach

3.1.1. This section of the **Health and Wellbeing Summary Statement** sets out the assessment of likely significant effects relevant to health and wellbeing reported within the ES and other relevant application documents during the construction, decommissioning and operational (including maintenance) phases with regards to health determinants, pathways and the characteristics of receptors within the baseline context and policy/strategy environment.

3.1.2. For each potential significant effect, this section highlights the scale of effect reported, its relationship to health pathways and determinants, and provides a summary or signposting to embedded and additional mitigation (and/or enhancements) developed as a result.

3.1.3. In line with IEMA Guidance [**Ref. 2**], effect magnitude is influenced by the levels and spatial scale of exposure to an effect, the frequency of the effect, the demonstrable relationship to mortality or changes in morbidity (physical or mental health) and change in quality-of-life.

3.1.4. In line with IEMA Guidance [**Ref. 2**], 'significant' (i.e. moderate or greater) health effects would generally mean that:

- Changes, due to the project, have an *influential or substantial* effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show *mixed views or consensus* on the importance of the effect.
- Change, due to the project, could result in a regulatory threshold or statutory standard being *approached or crossed* (if applicable).
- There is likely to be a *small or substantial* change in the health baseline of the population, showing there is a *clear or causal* relationship between changes that would result from the project and changes to health outcomes.
- In addition, health priorities for the relevant study area are of *general or specific* relevance to the determinant of health or population group affected by the project.

3.1.5. In line with IEMA Guidance [**Ref. 2**], 'non-significant' (i.e. moderate or greater) health effects would generally mean that:

- Changes, due to the project, have a *marginal* effect on (or 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 of limited policy influence and/or that *no relevant consultation themes* emerge among stakeholders.

- Change, 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 *very limited or slight* change in the health baseline of the population, showing there is an *unsupported* or at most *suggestive* relationship between changes that would result from the project and changes to health outcomes.
- In addition, health priorities for the relevant study area are of *no or low relevance* to the determinant of health or population group affected by the project.

3.1.6. A **Design Approach Document [EN010158/APP/5.8]** has been submitted as part of the DCO Application which demonstrates how the Proposed Development would fulfil the requirement for good design, both in terms of good design as a process and good design outcomes. It sets out how good design aspirations and intentions have cascaded through the design process and how these tangibly manifest themselves as good design outcomes that support sustainable development.

3.2. General Construction/Operational Activity, Behaviours, Health and Safety

Relevant Health Pathways / Determinants & Populations/Sub-populations

3.2.1. Moreover, general change and activity as a result of construction and operational activity – rather than linked to specific environmental effects – is raised by stakeholders as a contributor to mental and physical health.

3.2.2. Relevant health and wellbeing determinant(s) / pathway(s) (see **Table 1**):

- Risk taking behaviours;
- Community safety and crime;
- Community identity, culture, resilience and influence; and
- Social participation, cohesion, interaction and support.

Approach to Mitigation/Enhancement

3.2.3. The Applicant is committed to minimising impacts from construction on local residents.

3.2.4. Mitigation measures as set out in the relevant control documents, primarily (for construction) the **Outline CEMP [EN010158/APP/7.2]**, have been provided in response to the assessed likely impacts. These include:

- Committing that normal working hours will be between 7am to 7pm from Mondays to Fridays, and 7am to 12pm on Saturdays.
- No works will take place on Sundays or Public Holidays without prior agreement with Local Planning Authority as the host Local Planning Authority.
- Working days would consist of one 12-hour shift, with employees travelling to and from Site an hour on either side of these times (i.e. between 6am - 7am and 7pm - 8pm).
- Where onsite works are to be conducted outside the core working hours, they will comply with the restrictions pursuant to the DCO consenting process.
- Between 07:00 - 08:00 and 18:00 - 19:00 Monday to Friday and 07:00 – 08:00 on Saturdays, noisier activities (such as piling) would be restricted depending on the construction activity proposed to take place and its proximity to sensitive receptors.
- Activities such as trenchless/Horizontal Directional Drilling and Abnormal Indivisible Load (AIL) deliveries would be agreed upon with the relevant planning authority prior to these works.
- A Principal Contractor will be appointed to manage site security and any environmental risks that could arise during construction works, while site security fencing is set to remain in place throughout the duration of the construction period.
- Any storage of materials will be kept secure to prevent theft or vandalism while a safe storage system for accessing the materials storage areas would be implemented by the Principal Contractor.
- Construction temporary site lighting (in the form of mobile lighting tower) will be utilised where natural lighting is unable to meet sheltered and confined areas, in order to maintain sufficient security and health and safety for the Order Limits.
- Adopting The Considerate Constructors Scheme (CCS) to assist in reducing pollution and nuisance from the Scheme, by employing good practice measures which go beyond statutory compliance.
- An Emergency Preparedness and Response Plan will be developed in consultation with the relevant local authority emergency planning officer, emergency services including the local fire service, as well as the Environmental Agency in relation to responding to flood warnings and events, detailing the procedures for responding to incidents and emergencies.

- Engagement with utilities companies prior to commencement of construction activities to identify utilities and agree safe methods of working around existing utilities.
- Ensuring that where on-site works need to be conducted outside of core working hours, restrictions are agreed with relevant planning authorities and complied with.
- Measures to control and mitigate against dust tracking onto the highway (including vehicle wheel cleaning) will be implemented by the Principal Contractor, while a road sweeper will be deployed when required to remove mud and dust on the highway.
- The Site will be prepared well, with specific measures of this preparation process including localised site levelling, vegetation clearance, landscape planting, an establishment of perimeter fencing and other security measures.

3.2.5. Community liaison and communication throughout the construction phase would be undertaken to provide information to people residing in properties located in the vicinity of the Order Limits. A Community Liaison Group (CLG) will be established, with the Applicant being required to submit to the relevant planning authority for approval of the terms of reference for the Community Liaison Group. This group's aim is to facilitate liaison between representatives of people living in the vicinity of the Order Limits and other relevant organisations in relation to the construction of the Proposed Development. The community liaison would extend to landowners with livestock or other animals that may be present in fields adjacent to the construction works.

3.2.6. The level of engagement required would vary during the construction period, depending upon the likely impacts experienced by individual receptors due to the construction works.

3.2.7. Details relating to liaison with the local community would be managed by the Principal contractor. It is envisaged that community liaison would provide local residents with the following information in relation to the construction works:

- The nature of the works being undertaken;
- The expected duration of the works and the principal contractor's working hours;
- Mitigation measures that have been adopted to minimise noise and vibration; and
- Contact details in the event of a disturbance.

3.2.8. Community liaison will be secured through the **Outline CEMP [EN010158/APP/7.2]**.

3.2.9. A key element relating to predictability of the environment is the commitment (secured within the **Outline CEMP**) to the provision of information and community liaison which would ensure occupiers of neighbouring properties are informed in advance of the construction works. The community liaison officer would provide the community including particularly sensitive receptors with an appropriate person who would be appointed to lead discussions and act as the primary point of contact should there be any queries or complaints.

3.2.10. Measures relating to the provision of information and community engagement during the construction phase will more generally be provided for via a Community Liaison Group (CLG) will also be established for the duration of the construction period, whose aim is to facilitate liaison between representatives of people living in the vicinity of the Order Limits and other relevant organisations in relation to the construction of the Proposed Development.

3.2.11. The above measures would also be in place for the decommissioning phase – as set out within the **Outline DEMP [EN010158/APP/7.4]**.

3.2.12. Whilst these measures predominantly are in place to mitigate physical impacts, it is considered that full implementation of these measures will help to reduce negative perception and experience of construction activities in the local population.

3.2.13. During the operational (including maintenance) phase, the **Outline OEMP [EN010158/APP/7.3]** includes measures to minimise disruption to communities – including:

- The Site will generally be managed by 10 permanent staff per day during normal working hours (7 am to 7 pm) Monday to Friday, with additional staff attending when required for maintenance, replacement of equipment, vegetation management and cleaning;
- Security risk management threat assessments that will be conducted yearly at a minimum and also as needed to respond to any newly identified threat to safe and secure operation of a Site.
- CCTV cameras on-site will use night-vision technology which would be monitored remotely and remove the need for night-time lighting.
- No continual lighting, but manually operated and motion detection lighting to be utilised for safety purposes.
- The development of an Emergency Preparedness and Response Plan with the relevant local authority emergency planning officer, emergency services, outlining how flood warnings and other emergency events will be responded to.

- Maintaining a minimum 5 dB(A) reduction at source through refinement of the engineering requirements in order to adopt lower noise emitting transformers.
- Informing the local community on key project milestones to maintain an ongoing relationship over the entire lifetime the project, in addition to providing contact details on site and online for members of the community to contact the asset operations team.

3.2.14. Concerns may also relate to the health and safety of the construction and operational workforce employed at the site. The Applicant acknowledges this and has worked to commit that:

- Construction of the Proposed Development will be undertaken in accordance with the **Outline CEMP [EN010158/APP/7.2]** which includes measures to ensure the safety of workers and reduce risks to the general public. The **Outline CEMP [EN010158/APP/7.2]** also states that the Detailed Construction Environmental Management Plan (CEMP) will include a Construction Method Statement (CMS) that would be reviewed by both the Environmental Manager and the Health and Safet Manager to identify and control issues.
- The Project Director would be responsible for all legal compliance and for providing appropriate resources within the wider team such as staff and training. The Principal Contractor would be responsible for ensuring that all staff are adequately trained, minimising the risk of accidents, injuries and risk-taking behaviour during works on-site.
- At the operational stage, the proposed uses are not expected to support risk-taking behaviours. Such behaviours are generally influenced by individual personal characteristics and social behaviour. The extent to which planning and development can have an effect on human behaviour is limited beyond the influence of good design and management practices.

3.3. Air Quality

Relevant Health Pathways/Determinants & Populations/Sub-populations

3.3.1. Air quality is a key influence in the quality of the environment in which a population lives, with implications for long-term health. Poor air quality is associated with negative health outcomes, such as chronic lung disease, heart conditions and asthma, particularly among children.

3.3.2. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Air quality.

3.3.3. The more vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who may spend more time at homes in close proximity to the Order Limits.

Summary of Health-related Environmental Effects: Construction Phase

3.3.4. **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]** has assessed the increased risk of health effects due to release of dust and particulate matter emissions from the Proposed Development activities and road traffic exhaust emissions during the construction and decommissioning phase of development.

3.3.5. The impact of dust and road traffic exhaust emissions during the construction phase was quantified at sensitive receptors (e.g. residential properties, hospitals, schools and residential care homes) within 250m of the Order Limits.

3.3.6. Sensitivity of receptors was classified as follows:

- **High** – Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).

  Examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- **Medium** – Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).

  Examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by health and safety at work legislation.
- **Low** – Locations where human exposure is transient.

  Examples include public footpaths, playing fields, parks and shopping streets.

3.3.7. The assessment suggests that human health impacts from dust and particulate emissions generated from activities at the Proposed Development would be **low risk** for earthworks, construction and trackout

activities, and **negligible risk** for demolition (during decommissioning phase) activities.

3.3.8. The temporary nature and low level of air pollution at the Site, combined with embedded mitigation including setback distances from receptors as included within the **Design Commitments [EN010158/APP/5.9]** means it is unlikely there would be a risk of emissions (either in isolation or combination) that could result in an exceedance of Air Quality Standards, with the **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]** suggesting that there would be no exceedances of Air Quality Standards.

3.3.9. In terms of construction traffic-related air quality effects, the annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Site are expected to be well below the Air Quality Standards.

3.3.10. When adopting mitigation measures (outlined in the **Outline CEMP** / **Outline DEMP**), there would be a **negligible risk** for all activities for construction and decommissioning phases, resulting in the residual effect on human health being **not significant**.

3.3.11. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 2**], this assessment of a non-significant effect takes account of:

- The inherent consideration of health as a factor in setting air quality thresholds, for example in setting following Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction **[Ref. 32]** for the risk of health effects due to an increase in exposure to PM_{10};
- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Summary of Health-related Environmental Effects: Operational Phase

3.3.12. **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]** has assessed the increased risk of health effects due to road traffic exhaust emissions during the operational phase of development.

3.3.13. The impact of dust and road traffic exhaust emissions during the operational phase was quantified at human receptors (e.g. residential

properties, hospitals, schools and residential care homes) within 250m of the Order Limits.

3.3.14. Due to the nature of the Proposed Development, the principal operational (including maintenance) phase air quality is likely to be associated with traffic emissions as a result of any changes in traffic flows or flow composition the Proposed Development may bring.

3.3.15. The assessment suggests that given that the Proposed Development is not expected to generate traffic exceeding the Design Manual for Roads and Bridges LA105 Air Quality screening criteria once operational. Therefore the potential effects from road exhaust emissions during operation would **not be significant** for human receptors, suggesting that adverse effects on human health would be limited.

3.3.16. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 2**], this assessment of a non-significant effect takes account of:

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes;
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Approach to Design and Mitigation/Enhancement

3.3.17. Several mitigation measures have been embedded into the scheme as part of an iterative design process, resulting in the following being secured for the function of minimising the construction dust and exhaust emission impacts from the Proposed Development to residential properties and users of PRoW:

- The Proposed Development design will incorporate a minimum offset distance of 50m from ITS (Inverter and Transformer Stations) from all residential receptors – secured by the **Design Commitments [EN010158/APP/5.9];**
- There will be a minimum 10m offset from all perimeter fencing surrounding the Solar PV development to existing public rights of way – secured by the **Design Commitments [EN010158/APP/5.9];**
- Construction traffic routes have been designed to avoid passing any of the sensitive villages in close proximity to the Site, and residential receptors where possible to minimise disruption to local communities –

secured by the **oCTMP [EN010158/APP/7.5]** and **Outline DEMP [EN010158/APP/7.4].**

3.3.18. The embedded mitigation has been established based on Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction **[Ref. 32]**

3.3.19. Additional mitigation has also been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level. For air quality, these include:

- Appropriate, site-specific mitigation measures for management of dust and particulates, both in terms of general measures and measures specific to demolition, earthworks, construction and trackout, in accordance with Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction **[Ref. 32]**. These are listed in identified in **Table 6.14** of **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]** and secured within the **Outline CEMP [EN010158/APP/7.2],** the **Outline CTMP [EN010158/APP/7.5]** and the **Outline DEMP [EN010158/APP/7.4]**.
- Mitigation measures (described in **Table 6.16** of **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]** and documented within the **Outline CTMP [EN010158/APP/7.5]** relating to management of road traffic exhaust emissions during construction and decommissioning.
- Management of emissions from non-road mobile machinery by ensuring that any plant used on Site comply with the nitrogen oxides, particulate matter and carbon monoxide emissions standards specified in the Regulation (EU) 2016/1628 of the European Parliament and of the Council (as amended) as a minimum, where they have net power of between 37kW and 560kW. The emission controls are outlined and secured within the **Outline CEMP [EN010158/APP/7.2]** and the **Outline DEMP [EN010158/APP/7.4]**.
- Best practice mitigation measures (described in **Table 6.16** of **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]**) to further reduce any residual effects on air quality during the operational phase, secured via the **Outline OEMP [EN010158/APP/7.3].**

3.4. Noise and Vibration

Relevant Health Pathways/Determinants & Populations/Sub-populations

3.4.1. Noise has tangible links to the health of a population, particularly in places where people live or work in close proximity to sources of noise. Excessive noise is associated with mental health illnesses, stress-related illness, memory and cognitive function and disturbances in sleep, although the definition of excessive is subjective and not uniform in a population.

3.4.2. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Noise and vibration.

3.4.3. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- People with existing poor health (physical and mental health);
- Fixed-location community facilities and social infrastructure with a greater sensitivity to change as a result of their operations and characteristics of users (for example, with higher concentrations of people across with different neurodiversity, such as autism); and
- People with geographical factors e.g. unemployed, disabled, shift workers who may spend more time at homes in close proximity to the Order Limits.

Summary of Health-related Environmental Effects: Construction Phase

3.4.4. In terms of noise effects from construction activity at the Site, **ES Volume 2, Chapter 13: Noise and Vibration [EN10158/APP/6.2]** reports that in most cases, given the scale of the Site and the separation distances to surrounding receptors, it is expected that the majority of the construction works could be undertaken without causing an exceedance of the daytime 65 dB $L_{Aeq,T}$ threshold criterion.

3.4.5. In one location there would be exceedances – for noise receptor R24 (Blackmore Hill Farm Cottages). However, works giving rise to these exceedances are noted to be transitory in nature and would therefore only occur for a limited period of time, during working hours.

3.4.6. Road traffic noise is also considered in **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2]**. As a result of additional construction traffic in and around the Site. While in some cases the noise levels would increase, the effects aren't considered to be significant.

3.4.7. It is noted that construction noise may change the experience of users of PRoW across and adjacent to the construction works. **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2]** reports that:

- It could be expected that users of PRoW within or adjacent to the Order Limits may be subject to construction noise levels which exceed the typical pre-construction ambient noise levels.
- However, the construction activities affecting an individual route would often be localised, and the transitory nature of PRoW users would mean that they are not exposed to construction noise for an extended period.

3.4.8. Following the implementation of suitable additional mitigation measures, **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2]** reports a direct, temporary **minor adverse** effect, which is considered to be **not significant.**

3.4.9. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 2**], this assessment of a non-significant effect takes account of:

- The inherent consideration of health as a factor in setting community noise thresholds, as determined by WHO guidelines [**Ref. 3**] and the definition of LOAEL adopted in Planning Practice Guidance [**Ref. 34**];
- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Summary of Health-related Environmental Effects: Operational Phase

3.4.10. **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2]** suggests that noise arising from the operation of Inverters, Transformers, HVAC, and other ancillary electrical infrastructure required for the Solar PV development/BESS infrastructure has the potential to impact sensitive receptors surrounding the Site.

3.4.11. Operational noise, by source, is described in **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2]**, at **Table 13.8**, with the assessment of that noise on receptors set out in **Table 13.18.**

3.4.12. During the operational (including maintenance) phase, **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2]** reports that no sensitive receptor would experience daytime lowest observed adverse effect level (LOAEL) exceedances as a result of noise associated with the Proposed Development. Planning Practice Guidance determines this level as when "*noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life".*

3.4.13. The noise levels without additional mitigation are predicted to exceed the LOAEL design thresholds at the following sensitive receptors at night time:

- R2 – Bernwood Farm;

- R7 – Catherine Cottages;
- R12 – Hogshaw Farm;
- R18 – Sion Hill Farm;
- R20 – Borshaw Farm; and
- R24 – Blackmore Hill Farm Cottages.

3.4.14. However, following the application of additional mitigation measures, the predicted operation (including maintenance) phase noise levels throughout daytime and night-time periods would not exceed 35 dB $L_{Ar,T}$ at any receptors.

3.4.15. Noise levels of this magnitude are considered to successfully comply with the LOAEL criteria within Planning Practice Guidance – Noise **[Ref. 34]**, resulting in a direct, permanent **minor adverse** effect, which is considered **not significant.**

3.4.16. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [Ref. 4], this assessment of a non-significant effect takes account of:

- The inherent consideration of health as a factor in setting community noise thresholds, as determined by WHO guidelines [**Ref. 1**] and the definition of LOAEL adopted in Planning Practice Guidance [**Ref. 34**];
- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes;
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Approach to Design and Mitigation/Enhancement

3.4.17. Several mitigation measures have been embedded into the scheme as part of an iterative design process, resulting in the following being secured for the function of reducing noise impact at the nearest noise sensitive receptors/residential properties:

- Maximising the separation distance between proposed infrastructure and surrounding sensitive receptors, where practicable – secured by the **Works Plans [EN010158/APP/2.3]** and the **Design Commitments [EN010158/APP/5.9]**;

- Use of equipment with low noise emissions, where feasible – secured by the **Outline CEMP [EN010158/APP/7.2], Outline OEMP [EN010158/APP/7.3]** and **Outline DEMP [EN010158/APP/7.4]**; and
- Orientating noise emitting equipment to reduce noise level beyond the Order Limits – secured by the **Outline CEMP [EN010158/APP/7.2], Outline OEMP [EN010158/APP/7.3]** and **Outline DEMP [EN010158/APP/7.4]**.

3.4.18. Additional mitigation has also been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level. For noise, these include:

- The implementation of 'Best Practicable Means' as defined by the Control of Pollution Act 1974 [**Ref. 35**], which would serve to minimise the potential noise and vibration impacts at receptors in the vicinity of the construction works, secured by the **Outline CEMP [EN010158/APP/7.2], Outline OEMP [EN010158/APP/7.3]** and **Outline DEMP [EN010158/APP/7.4]**;
- A number of measures that may be employed where reasonably practicable to mitigate the noise level impact from the construction and decommissioning phases secured in the **Outline CEMP [EN010158/APP/7.2]:**
    - Temporary noise barriers close to noise-producing plant to minimise construction induced noise levels, where there is potential for the construction works to give rise to medium or high impact magnitudes at noise sensitive receptors;
    - Where practicable, temporary enclosures will be used to screen all static or semi-static plant from noise sensitive receptor locations;
    - All engine compartments or acoustic enclosures are closed whilst engines are running;
    - Minimising drop heights of materials i.e. carefully depositing materials;
    - Avoiding vehicle movements over irregular surfaces (which tends to create more noise/vibration emissions);
    - At all times, workers' shouting or raised voices to be kept to a minimum;
    - All plant, equipment and noise control measures applied to plant and equipment to be maintained in good and efficient working order and operated such that noise emissions are minimised as far as reasonably practicable.
    - Any plant, equipment or items fitted with noise control equipment found to be defective will not be operated until repaired;

- Machines in intermittent use to be shut down or throttled down to a minimum during periods between works;
- A quiet working ethic will be employed to ensure that all members of the workforce have consideration for the nearby residents;
- Prohibit sounding of vehicle horns to gain access to the Primary and Secondary Construction Compounds;
- The delivery routes set out in the **Outline CTMP [EN010158/APP/7.5]** will be communicated to and adhered to by all suppliers;
- Design the Primary Construction Compound and Secondary Construction Compound layouts to reduce the need for reversing vehicles and ensure that drivers are familiar with the worksite layout;
- Utilise reversing alarms incorporating one or more of the features listed below (or other comparable system):
  - Highly directional sounders;
  - Use of broadband sounders;
  - Self-adjusting output sounders;
  - Flashing warning lights; and
  - Reversing alarms that are set to the minimum output noise level required for health and safety compliance.
- Toolbox talks carried out by the principal contractor to ensure that all members of the workforce are aware of potential noise impacts on the sensitive receptors in the surrounding area.

3.4.19. During the operational (including maintenance) phase, in the case of the main transformers being a major component of the acoustic emissions from the Proposed Development, it is proposed that a minimum 5 dB(A) reduction is obtained at source through refinement of the engineering requirements in order to adopt lower noise emitting transformers. This will be secured through the **Outline OEMP [EN010158/APP/7.3]**.

3.4.20. In addition, several barriers will be in place during operation to limit noise, secured through the **Outline OEMP [EN010158/APP/7.3]**:

- 3.5m high barrier around the BESS container areas;
- 5m high barrier around sections of the boundary of the Rosefield Substation;
- 3.5m high absorptive barriers around Central Inverters that are impacting upon noise-sensitive receptors; and

- Introduction of enclosures and/or barriers around the main transformers within the Rosefield Substation and Satellite Collector Compound.

3.5. Landscape and Visual Effects

Relevant Health Pathways/Determinants & Populations/Sub-populations

3.5.1. Visual amenity is a key influence in the quality of the environment in which a population lives, with implications for long-term health. Poor visual amenity is associated with increased stress and an overall diminished quality of life.

3.5.2. Visual effects relate to changes that arise in the composition of available public views as a result of changes to the landscape, to people's responses to the changes and to the overall effects with respect to visual amenity. Higher sensitivity (or susceptibility) is attributed to those living within view of the Proposed Development, as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective.

3.5.3. Stakeholders and members of the community have raised through response to statutory and non-statutory consultation, and through engagement, that change to the landscape character of the area as a result of the Proposed Development may have a wide-ranging detrimental impact on the desirability of the locality to live and visit, thus having a negative impact on residential amenity and enjoyment of where people live, resulting in effects on mental health and wellbeing.

3.5.4. The Applicant notes that assigning an effect on personal perception of the landscape and its mental health and wellbeing value is dependent on subjective interpretation of the landscape as a whole, and of individual views by an individual and collective set of receptors. Nonetheless, there are identified sensitive receptors in the area that have inherent recreational (such as PRoW) or cultural (such as the setting of Claydon House and Claydon Grade II Registered Park and Garden) value which may be affected by the change in visual environment.

3.5.5. **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2]** principally considers the impacts on public views – users of PRoWs and other road networks, users of East West Rail, residents and visitors of local visitors/settlements, recreational and tourist receptors and landscape character areas.

3.5.6. However, **ES Volume 4, Appendix 10.5: Residential Visual Amenity Assessment [EN010158/APP/6.4]** also assesses potential effects on residential properties (i.e. *private* views) in terms of 'residential amenity', which are summarised in **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2]**.

3.5.7. Guidance from the Landscape Institute Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA) (TGN 2/19) [**Ref. 36**] suggests that 'Residential Visual Amenity Assessment' is conducted to advise on whether a development will change the visual amenity of a property to such an extent that it becomes a matter of 'Residential Amenity'.

3.5.8. In turn, the RVAA assesses whether the Proposed Development would be 'over bearing' or 'dominating' at any residential property that the visual effect would be regarded as 'unpleasant' or 'unattractive' to live. This is assessed using the 'Residential Visual Amenity Threshold', which helps determine if the visual impact affects overall living conditions.

3.5.9. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Physical activity;
- Access to open space, nature leisure and play; and
- Community identity, culture, resilience and influence.

3.5.10. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who may spend more time at homes in close proximity to the Order Limits.

3.5.11. Effects relating to the in-combination environmental impacts on users of PRoW (active recreation in the environment) including landscape and visual amenity effects are considered in **Section 4**. Effects and mitigation relating to mental health and wellbeing are considered further in **Section 5.**

Summary of Health-related Environmental Effects: Construction Phase

3.5.12. **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2]** presents an assessment of likely significant effects arising from construction, operation and decommissioning of the Proposed Development on landscape and visual amenity.

3.5.13. When looking at effects on visual amenity, **significant major** or **moderate** adverse visual effects during the construction and decommissioning period were reported at the following receptors:

- Six PRoW (including North Buckinghamshire Way/Midshires Way, Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3); and
- Hogshaw Farm and Wildlife Park.

3.5.14. All other visual amenity effects on sensitive receptors were recorded to be **moderate/minor** adverse or **minor/negligible** adverse (**not significant**) – this includes **non-significant effects** (**negligible** or **minor/minor to moderate adverse**) for seven PRoWs (including NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring);

3.5.15. Effects related to landscape and visual amenity are reported as **moderate/minor adverse (not significant)** in terms of a varied visual experience of construction activity from the public footpath (PRoW MCL/10/2) and parkland at Viewpoint 5 that reflects the receptor group for Claydon House, identified as an important cultural receptor in its setting.

3.5.16. However, it is noted that for Claydon House, effects related to cultural heritage which draw upon the effects of visual amenity on setting for cultural heritage are reported as **slight adverse (not significant)** in terms of construction activity in the setting of Claydon House and Claydon Grade II Registered Park and Garden.

Summary of Health-related Environmental Effects: Operational Phase

3.5.17. During the operational phase, **significant major** or **moderate** adverse operational effects were recorded within the assessment on the following receptors:

- LCA 5.7: Hogshaw Claylands (moderate adverse);
- LCA 7.3: Claydon Bowl (moderate adverse);
- LCA 9.1: Finemere Hill (major/moderate adverse);
- Five PRoW (including Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3);
- Claydon House (moderate adverse); and
- Hogshaw Farm and Wildlife Park (moderate adverse).

3.5.18. There were also a number of other **minor** and **moderate** adverse effects on receptors that were deemed to be **not significant**, while a moderate beneficial (significant) effect was identified on the landscape fabric during the tenth year of operation.

3.5.19. **Non-significant** visual effects (**negligible** or **minor/minor to moderate adverse**) will occur for eight PRoWs (including North Buckinghamshire Way/Midshires Way, NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring).

3.5.20. It is noted that effects related to cultural heritage (which draw on visual amenity in terms of effects on setting for cultural heritage) are reported as **slight adverse (not significant)** in terms of operational (including maintenance) activity in the setting of Claydon House and Claydon Grade II Registered Park and Garden.

3.5.21. **ES Volume 4, Appendix 10.5: Residential Visual Amenity Assessment [EN010158/APP/6.4]** assesses potential effects on residential properties specifically, which are summarised in **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2].**

3.5.22. **ES Volume 4, Appendix 10.5: Residential Visual Amenity Assessment [EN010158/APP/6.4]** suggests that residents of 4-5 Catherine Cottages and 6-7 Catherine Cottages would experience significant visual effects during year 1. Due to the establishment of mitigation, these effects would reduce in magnitude by year 10 and would not be significant. Only residents of dwellings at Bernwood Farm and Sion Hill Farm would experience significant visual effects during both years 1 and 10 of operation.

3.5.23. The assessment concludes that the Proposed Development would not have an overbearing effect on the visual amenity experienced by residents of properties around the Proposed Development.

Approach to Design and Mitigation/Enhancement

3.5.24. The Applicant has developed the design of the Proposed Development to provide a sensitive response to the local environment and reduce potential impacts in accordance with the Project Principles set out in the **Design Approach Document [EN010158/APP/5.8].**

3.5.25. The design includes embedded screening measures to reduce visibility where possible, while additional mitigation measures include the adoption of the following management plans:

- **Outline CEMP [EN010158/APP/7.2]**
- **Outline LEMP [EN010158/APP/7.6]**
- **Outline SMP [EN010158/APP/7.7]** and
- **Outline DEMP [EN010158/APP/7.4].**

3.5.26. Changes to visual amenity on PRoW will be mitigated against as far as is reasonably practicable, in the form of new hedgerow planting or structural planting belts. Several design measures have been embedded into the scheme as part of an iterative design process, resulting in the following being secured for the function of avoiding or reducing the significance of landscape and visual effects:

- New hedgerow planting to footpath within Fields B1 and B4 to soften views and provide medium long term screening of views from PRoW SCL/12/1;
- New hedgerow planting along the western boundary of Field B5, adjacent to Pond Farm access to soften views and provide medium and long term screening of views from the access track to properties and Calvert Road;
- Hedgerows to the south of Calvert Road and east of Claydon Road to be gradually increased in height to 3.5m to soften views and provide screening from Calvert Road and Claydon Road;
- 15m width belt of structural native woodland (advanced) planting along northern and southern boundaries of Field B5 soften views/provide screening of Solar PV modules from Calvert Cottages and footpath diversions;
- 30m width buffer of species rich grassland and scrub to Decoypond Wood (Field B7) to provide screening of Solar PV modules from footpath conversion;
- 50m width buffer of species rich grassland and scrub to Shrubs Wood (Fields B6 and B10) to provide screening of Solar PV modules from footpath diversions and proposed permissive footpath to Knowl Hill;
- New hedgerow (advanced) planting to the eastern boundary of Solar PV modules in Field B22, and north of Field B23 (North) to soften/screen views of Solar PV modules and Satellite Collector Compound from Calvert Road, Catherine Cottages and Blackmorehill Cottages;
- Infill hedgerow planting and strengthening of avenue of poplar trees to Three Points Lane to soften/screen views of Solar PV modules and Satellite Collector Compound from Calvert Road and Claydon Park;

- 15m width belt of structural native woodland (advanced) planting along northern boundary of Field D3 (South) to provide screening from PV modules from Botolph Claydon and PRoW ECL/9/2 and ECL/10/1;
- New hedgerow/infill planting to the eastern and western boundaries Fields D3 (South), D12 and D13 to soften/screen views of Solar PV modules and Satellite Collector Compound from Bernwood Jubilee Way/ PRoW ECL/8/1;
- 50m width buffer of species rich grassland and scrub to Runt's Wood (Fields D28 and D29) to provide screening of views of Solar PV modules from PRoW ECL/8/2 and permissive footpath between PRoW ECL/8/2 and QUA/42/2;
- 15m width belt of structural native woodland (advanced) planting along southern boundary of Fields D8, D9, D19 and D26 to screen views of Solar PV modules, Satellite Collector Compound and BESS from Claydon Road, Hogshaw Farm and PRoW HOG/7/1;
- 15m width belt of structural native woodland (advanced) planting along western boundary of Fields E11, E20, E21, E22 and E23 to screen views of Solar PV modules, Main Collector Compound and Rosefield Substation from Botolph Claydon, Sion Hill Farm, Bernwood Jubilee Way, North Buckinghamshire Way/Midshires Way and PRoW ECL/4/1;
- New hedgerow planting to northern edge of Solar PV modules in Field E23 to provide screening of views from North Buckinghamshire Way/Midshires Way/ PRoW ECL/5/1;
- Structural planting will consist of native and indigenous species and wherever possible be of local provenance to ensure that new planting complements existing habitats;
- Grassland open fields and margins with species rich grassland throughout the Site for biodiversity purposes;
- Perimeter fencing surrounding the Solar PV development will be offset at least 15m from existing woodlands and at least 10m either side from all existing hedgerows to protect and retain existing trees and hedgerows;
- Perimeter fencing surrounding the Solar PV development will not be constructed through existing hedgerows or across ditches where practicable to protect and retain existing trees and hedgerows; and
- Perimeter fencing surrounding the Solar PV development will be offset at least 15m from either side of existing and proposed statutory PRoW to maintain visual amenity of users of PRoW.

3.5.27. Additional mitigation has also been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level, where practicable. For landscape and visual effects, these include:

- The **Outline CEMP [EN010158/APP/7.2]** which will:
  - ensure that construction is undertaken in a sensitive manner with regard to the existing landscape fabric within the Site;
  - ensure that all existing hedgerows, trees and woodland would be retained and protected during construction (except where removal is indicated on the vegetation removal plans shown in **Outline LEMP, Appendix 3: Vegetation Removal Parameters [EN010158/APP/7.6]**); and
  - ensure that construction compounds maintain a neat and tidy appearance and that any temporary construction lighting is operated in accordance with an agreed scheme.
- The **Outline CTMP [EN010158/APP/7.5]** which will ensure that construction vehicle movements would be routed in accordance with the strategy agreed with Buckinghamshire Council and avoid landscape and visual effects on additional receptors; and
- the **Outline LEMP [EN010158/APP/7.6]** which will:
  - establish the principles for maintenance of existing and newly established habitats and planting;
  - ensure, amongst other things, that any defective planting is replaced during the establishment period;
  - all new planting establishes successfully by Year 10; and
  - ensure that existing and new hedgerows (once established) will be maintained at a minimum height of 3.5m for the duration of the operation phase of the Proposed Development.

Summary of Significance – Health and Visual Amenity

3.5.28. Overall, therefore, there are likely to be a mix of significant and non-significant effects on visual amenity, which are likely to translate into the potential for effects on physical and mental health and wellbeing, in some instances, and in the context that such pathways are often individual and subjective. Importantly, it is noted that:

- The Proposed Development would not have an overbearing effect on the visual amenity experienced by residents of properties;
- Significant visual effects occur on some but not all of the ProW within and around the Site;
- Mitigation is secured – both embedded and additional – to address effects where practicable, and this reflects good practice and has been developed iteratively through consultation and engagement.

3.5.29. In consideration of the significance of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 2**], it is considered that:

- Changes, due to the Proposed Development, are not considered to have an *influential* effect on the ability to deliver current health policy and/or the ability to narrow health inequalities – though it is noted that consultation/engagement themes among stakeholders show consensus on the importance of the effect;
- Change, due to the Proposed Development, would not exceed appropriate regulatory thresholds, guidance or statutory standards (as have been assessed by **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2]** to the effect that it would result in substantial harm to the visual environment; and
- In general, there is the potential for a slight or small change in the health baseline of the population – with some greater than small (i.e. significant) effects, albeit this is subjective and geographically limited to locations and areas experiencing significant effects, and this relates to public views (on receptors where there is an alternative/substitute e.g. PRoW), with no significant effects on residential properties and their inhabitants.

3.6. Effects on Traffic, Transport and Access

Relevant Health Pathways/Determinants & Populations/Sub-populations

3.6.1. There is the potential for health and wellbeing effects should changes to access (both for drivers and walkers, cyclists and horse riders (WCH)) prevent access between residential and community facilities, and/or dissuade individuals from walking or cycling (either recreationally or for other purposes).

3.6.2. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Physical activity;
- Access to open space, nature leisure and play;
- Transport modes, accessibility, active travel and connections;
- Community safety and crime;
- Social participation, cohesion, interaction and support; and
- Access to health and social care services and other social infrastructure.

3.6.3. The vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people; and
- People with existing poor health (physical and mental health).

Summary of Environmental Effects: Construction Phase

3.6.4. Construction traffic may cause changes to accessibility on the local highway network, and this has the potential to affect access or amenity of community and recreational facilities should it cause delays to visitor journey times, changes to access, or pedestrian amenity effects, delay or fear and intimidation on the PRoW network, for example.

3.6.5. This is assessed in **ES Volume 2, Chapter 15: Transport & Access [EN010158/APP/6.2]** – which reports that without additional mitigation, it is considered possible that adverse effects such as severance, driver delay, pedestrian delay, non-motorised amenity, and fear and intimidation may occur on or be experienced by users of Station Road/Dewes Lane, Snake Lane/Fiddlers Field and Granborough Road. However – this is likely due to the relatively low baseline traffic flow on these roads at present.

3.6.6. Following the application of mitigation, the significance of the effects reported in **ES Volume 2, Chapter 15: Transport & Access [EN010158/APP/6.2]** is minor and not significant, including on PRoW, Bridleway and Path Users within the development areas, who are identified as a high sensitivity receptor.

3.6.7. Effects on community access via PRoW during the construction phase are assessed at **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2].**

3.6.8. During the 30-month construction phase, existing PRoWs that interact with the Order Limits would be kept open as far as it is practicable and safe to do so. However, where it is not practicable and safe, some PRoWs may need to be temporarily diverted.

3.6.9. Where PRoWs are to be temporarily diverted or closed, the duration of such a diversion/closure in that area would be for a maximum period of 6 months. The **oRoWAS [EN010158/APP/7.8]** details this and forms the framework for detailed RoWAS for long-term diversions, which are to be developed by the principal contractor to cover all phases of the Proposed Development.

3.6.1. In some cases, permanent diversions would be put in place during the construction phase. During the construction phase, the following five PRoW routes (defined either by their individual reference, or as a combination of individual references representing a route with a single origin and destination) would be permanently stopped up, with diversions provided in each case. In each case, the path would not be closed until the replacement has been completed to the satisfaction of the Local Highway Authority and is open for use:

- A diversion to the existing PRoW Footpath (reference ‘ECL/4/2’) (463m to-be-stopped up) to the north of Parcel 3 to align the PRoW Footpath

with the field boundaries of Fields E10 and E11, rather than crossing Field E11 (new length 559m), resulting in a 21% (or 96m) increase in length of this section of the link;

- A diversion to the existing PRoW Footpath (reference 'ECL/7/2') (244m to-be-stopped up) to the east of Parcel 2 to align the PRoW Footpath with the field boundary of Field D19 (new length 274m), resulting in a 12% (or 30m) increase in length of this section of the link;
- A diversion to the existing PRoW Footpath (reference 'SCL/13/2') (323m to-be-stopped up) to the south of Parcel 1 (between Shrubs Wood and Decoypond Wood) to align the PRoW Footpath with the field boundary of Field B7 (new length 410m), resulting in a 27% (or 87m) increase in length of this section of the link; and
- Diversions to three existing PRoW Footpaths (references 'SCL/13/1', 'SCL/12/2' and a further diversion to 'SCL/13/2') (1,470m to-be-stopped up) to rationalise them into a single PRoW Footpath providing access between Pond Farm and Calvert Road (new length 1,027m), resulting in:
  - a 13% (or 155m) increase in origin-destination for WCH using SCL/13/1 and, SCL/12/2; and/or
  - a 3% (or 44m) decrease in origin-destination for WCH using SCL/13/2 and, SCL/12/2.

3.6.2. These diversions would then become permanent and would therefore be in place throughout the operation (including maintenance) and decommissioning phases of the Proposed Development and remain post-decommissioning.

3.6.3. Short-term, temporary diversions to footpaths will only be required during track and cable trench construction activities when it will be necessary to form the access track across existing footpath alignments.

3.6.4. Additionally, during the construction phase, construction traffic has the potential to interact with walkers, cyclists and equestrians using the existing footpath network.

3.6.5. Overall, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** reports that there is likely to be a **slight adverse** residual effect on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant.**

3.6.6. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 4**], the assessments of a non-significant effect in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** and **ES Volume 2, Chapter 15: Transport & Access [EN010158/APP/6.2]** takes account of:

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards and in-line with appropriate guidance which considers thresholds for change in accessibility;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Summary of Health-related Environmental Effects: Operational Phase

3.6.7. Transport and access issues resulting from the operation of the Proposed Development have been scoped out of the ES due to the low level of traffic generated during the operation (including maintenance) phase as detailed within **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]** and confirmed within **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4].**

3.6.8. In light of this assessment, changes to severance, driver delay, non-motorised user amenity and fear & intimidation in terms of the public highway and its users would not be anticipated to affect the factors that contribute to health pathways, including the use of community/recreation facilities and the service that these facilities provide. Users of these facilities would not be deterred from using these facilities by any traffic/transport or access impacts.

3.6.9. Effects on community access via PRoW during the operational phase are assessed at **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]**.

3.6.10. During the operational (including maintenance) phase, all temporary PRoW closures related to construction works would be complete, and the Proposed Development will have provided increased accessibility and (3) recreational permissive paths as shown within **ES Volume 3, Figure 3.10: Existing and Proposed PRoW and Permissive Footpaths [EN010158/APP/6.3]**.

3.6.11. At the operation (and maintenance) phase, the diversion of five PRoW will have been completed, with the replacement/diverted PRoW open and accessible. These are:

- A diversion to the existing PRoW Footpath (reference 'ECL/4/2') (463m to-be-stopped up) to the north of Parcel 3 to align the PRoW Footpath with the field boundaries of Fields E10 and E11, rather than crossing

Field E11 (new length 559m), resulting in a 21% increase in length of this section of the link;

- A diversion to the existing PRoW Footpath (reference 'ECL/7/2') (244m to-be-stopped up) to the east of Parcel 2 to align the PRoW Footpath with the field boundary of Field D19 (new length 274m), resulting in a 12% increase in length of this section of the link;
- A diversion to the existing PRoW Footpath (reference 'SCL/13/2') (323m to-be-stopped up) to the south of Parcel 1 (between Shrubs Wood and Decoypond Wood) to align the PRoW Footpath with the field boundary of Field B7 (new length 410m), resulting in a 27% increase in length of this section of the link; and
- Diversions to three existing PRoW Footpaths (references 'SCL/13/1', 'SCL/12/2' and a further diversion to 'SCL/13/2') (1,470m to-be-stopped up) to rationalise them into a single PRoW Footpath providing access between Pond Farm and Calvert Road (new length 1,027m), resulting in:
  - a 13% increase in origin-destination for WCH using SCL/13/1 and, SCL/12/2; and/or
  - a 3% decrease in origin-destination for WCH using SCL/13/2 and, SCL/12/2.

3.6.12. **ES Volume 3, Figure 3.10: Existing and Proposed PRoW and Permissive Footpaths [EN010158/APP/6.3]** provides a plan showing the existing PRoW network as well as the recreation and amenity improvements. In terms of new permissive paths, this includes:

- A new public route across Parcel 1 by connecting the to-be-rationalised PRoW Footpath (reference 'SCL/13/2') before tracking east to the south of Shrubs Wood, east across Knowl Hill (Field B17) and then tracking north towards Three Points Lane (approximate length 1.9km);
- A new public route across Parcel 1 connecting the above permissive path beginning from the intersection between Fields B17, B20 and B21 which then runs north to the west of B21 and B22 to Calvert Road and onwards to PRoW Footpath (reference 'MCL/13/1') (approximate length 0.7km); and
- A new public route across Parcel 2 which connects the existing PRoW Footpath (reference 'ECL/8/1') before tracking west along the north of D3 (South) to PRoW Footpath (reference 'ECL/9/2'') and PRoW Bridleway (reference 'ECL/10/2') (approximate length 0.5km).

3.6.13. The proposed permissive footpaths would be implemented during the construction phase, and would remain open and accessible to the public during the operation (including maintenance) phase, save for any occasional closures to allow for farming activities to be undertaken safely, and to comply with their status as a permissive path.

3.6.14. **ES Volume 3, Figure 3.10: Existing and Proposed PRoW and Permissive Footpaths [EN010158/APP/6.3]** illustrates the permanent PRoW diversions and the new permissive footpaths. The **Outline RoWAS [EN010158/APP/7.8]** forms the framework for detailed Rights of Way and Access Strategy Plan(s) which is to be developed by the principal contractor to cover all phases of the Proposed Development. The outline framework submitted with this DCO Application details the principles, management and inspection requirements as well as the extent and nature of any closure, diversion and/or improvement to the PRoW network and permissive footpaths.

3.6.15. At the operational phase, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** reports that:

- The diversion of PRoW ECL/7/2, SCL/13/1, SCL/12/2, SCL/13/2 and ECL/4/2) is likely to result in a **slight adverse** effect on these links.
- However, in the case of diverted routes combining SCL/12/2 and SCL/13/2, there is a decrease in journey length which would result in a **neutral** or **slight positive** effect for that link.
- The creation of new permissive paths would also increase community accessibility and recreational opportunities in an area that is currently inaccessible. The routes would improve community connectivity between the existing public highway and community areas such as East Claydon, Middle Claydon and Botolph Claydon in the east and Calvert in the west.
- Overall, therefore on balance there is likely to be a **permanent**, **slight beneficial** residual effect on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant**.

3.6.16. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 4**], the assessments of a non-significant effect in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** and **ES Volume 2, Chapter 15: Transport and Access [EN010158/APP/6.2]** takes account of:

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards and in-line with appropriate guidance which considers thresholds for change in accessibility;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Approach to Design and Mitigation/Enhancement

3.6.17. Several mitigation measures have been embedded into the scheme as part of an iterative design process, resulting in the following being secured for the function of removing construction traffic from villages, reducing adverse impacts in sensitive areas, and ensuring access and road/PRoW safety and efficiency for all users:

- The proposed construction access route avoids passing through villages, and all HGV traffic for the BESS and north eastern portion of the Site will be routed through the main access and will approach Granborough Road from Quainton Road, removing the need for a constrained 90 degree turn at the junction, Ensuring road safety and efficiency for all users and reducing the need for intrusive road enhancement works - Routing requirements set out in **Outline CTMP [EN010158/APP/7.5]**; and
- The construction and operational site access junctions are designed to allow for two-way traffic flows and sufficient visibility in all directions, ensuring road safety and efficiency for all users – secured via the **Draft DCO [EN010158/APP/3.1]**.

3.6.18. As set out above, the design of the scheme also includes diversions to PRoW, and the provision of new recreational and connectivity-providing permissive paths, as set out within the **Outline RoWAS [EN010158/APP/7.8], Streets, Rights of Way and Access Plans [EN010158/APP/2.4]** and the **Draft Development Consent Order [EN010158/APP/3.1]**.

3.6.19. Additional mitigation has also been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level. For traffic, transport and access, these include:

- **An Outline CTMP [EN010158/APP/7.5]** will provide mitigation in terms of managing the transport and environmental effects on receptors related to construction traffic. This include measures within **Section 6** (On-Site Access Management Proposals) to limit disruption to users of PRoW and permissive paths, provide information and correct any damage caused by construction activity, and ensure safety of users. The CTMP will control traffic movements, facilitate community liaison and feedback, detail signage, include road wear and tear requirements and cater for AIL movements; and
- **An Outline RoWAS [EN010158/APP/7.8]** will provide mitigation in terms of the approach to management and maintenance of existing, diverted and new PRoW and permissive paths during the construction, operation (including maintenance) and decommissioning phases. In particular, the creation of new permissive paths including a permissive

path to Knowl Hill, with interpretation measures for Claydon House and Claydon Park and Garden, will mitigate effects (and potentially provide enhancement) relating to community access. The approach will ensure safe access across the Order Limits for pedestrians, cyclists and equestrians.

3.7. Socio-economic Effects

Relevant Health Pathways/Determinants & Populations/Sub-populations

3.7.1. Employment and income is intrinsically linked to health, with good quality employment leading to positive impacts on health and wellbeing, and the availability of high quality jobs being key to achieving inclusive economic growth. In the same way, employment can also be associated with health inequality, with adverse physical and psychological conditions of work, the risk of job loss/redundancy and poor pay having the potential to have an adverse impact of human health (Pickett et al., 2006) [Ref. 37]. At an individual level, there are many factors that can influence people's emotional wellbeing/self-worth, including access to employment.

3.7.2. Poverty can further diminish an individual's sense of control. People in the lowest 20% of household incomes have an almost threefold increased risk of mental illness; a similar pattern is seen with unemployment (McManus et al., 2016) [**Ref. 38**].

3.7.3. Research published by the UK Parliament considers that farmers and agricultural workers are at a particular high risk of mental health illness and suicide [**Ref. 39**]. Particular drivers of the mental health problems for agricultural workers include working long hours, living at work, family pressures, poor physical health and agricultural crime. Agricultural work and farming cultures can also bring about the problem of social isolation, caused by lone-working in isolated rural areas and the constant need to be available [**Ref. 40**].

3.7.4. Health impacts can also arise from financial insecurity which can contribute to a feeling of unpredictability and uncertainty amongst farm workers. Economic, regulatory and administrative pressures such as credit accessibility and reductions in bargaining power can also result in adverse mental health outcomes.

3.7.5. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Social participation, cohesion, interaction and support;
- Education and training; and
- Employment and income.

3.7.6. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who may spend more time at homes in close proximity to the Order Limits.

Summary of Environmental Effects: Construction Phase

3.7.7. During the operational phase, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** reports that over a phased period, all of the agricultural land within the fields identified for accommodating long-term activity under **Works No 1, 2, 3, 4, 5 and 8** (see the **Works Plans [EN010158/APP/2.3])** would be taken out of agricultural use, and this would be for the duration of the construction and operational phases. This represents a temporary (construction, operation (including maintenance) and decommissioning phase) long-term change in agricultural capacity.

3.7.8. Cabling and other supporting activity will also be undertaken in areas under **Works No. 6 and 7**, this represents a temporary (construction only) short-term change in agricultural capacity.

3.7.9. It is important to note that the short-term change in agricultural capacity is based on a worst case scenario. Not all of this land is expected to be unavailable for the entire duration of the construction phase as cabling is set to be done in stages, moving across different parts of the Proposed Development.

3.7.10. Overall, the temporary land-take at the Site during the 30-month construction phase would result agricultural land being taken out of agricultural use – equivalent to around 0.65% of agricultural land in Buckinghamshire.

3.7.11. Indicatively, based on county-wide average employment per ha this would result in the temporary, long-term reduction of the indicative capacity for up to around 10 FTE jobs, and temporary, short-term reduction of the indicative capacity for up to around 5 FTE jobs (total agricultural employment in Buckinghamshire is estimated at approximately 2,237 FTE jobs) during the construction phase.

3.7.12. Engagement with the agricultural operators has confirmed that the actual employment supported by the agricultural land affected by construction activity is lower than the indicative capacity, and therefore the above assessment sets a hypothetical, 'worst-case' assessment of employment capacity rather than actual net employment reduction which would be influenced by commercial agreements between the Applicant and agricultural operations affected.

3.7.13. The landowner has negotiated with tenants to agree financial compensation or land swaps (or Heads of Terms for the same) where land within the Order Limits would not be available for agricultural use during construction (and operation) of the Proposed Development such that effects on viability of agricultural and non-agricultural businesses would not be adversely affected, and therefore changes to employment supported would be limited.

3.7.14. Where tenants are provided a land swap, Heads of Terms for replacement land (with land already in the Claydon Estate's ownership) that is equally productive, of similar size and quality, and accessible to each tenant, have been agreed where relevant such that effects on viability of those agricultural businesses would not be adversely affected.

3.7.15. In some cases, the landowner has negotiated financial compensation (or Heads of Terms for the same) with tenants/occupiers to compensate for the use of the tenanted land instead of providing a land swap.

3.7.16. Where land is temporarily required on a short-term basis for construction activity but can then be returned to agricultural use, this land (except for access routes within it) would continue to be farmed after construction, with interim compensation arrangements agreed during the construction phase when that land is inaccessible where this applies.

3.7.17. The significance of this effect on people and businesses working in the agricultural and supporting (non-agricultural) sectors is reported as **slight adverse (not significant)**.

3.7.18. The positive socio-economic effects of the Proposed Development are reported in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]**, which sets out that:

- A total of 600 direct, on-site FTE construction jobs will be supported for the duration of the 30-month construction programme.
- The employment supported will be in a range of different positions and skillsets across civil construction sectors, electrical and mechanical skills including specialised solar installation professionals and some non-construction and supporting roles such as security, process and administrative and transportation roles. Employment supported will also be in a range of tenures depending on the work package/contract and contractor at each phase of construction.

3.7.19. The significance of this effect is reported as **neutral/slight beneficial**.

3.7.20. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 4**], this assessment of a non-significant effect takes account of:

- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes;
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Summary of Environmental Effects: Operational Phase

3.7.21. During the operational phase, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]** reports that the Proposed Development would result in agricultural land being taken out of agricultural use, amounting to up to 0.43% of agricultural land in Buckinghamshire.

3.7.22. Indicatively, based on county-wide average employment per ha this would result in the reduction of the indicative capacity for up to around 10 FTE jobs (total agricultural employment in Buckinghamshire is estimated at approximately 2,237 FTE jobs).

3.7.23. At the operational phase, commercial agreements (including land swap and compensation) described above would be in place. In all cases at the point of submission of this application, Heads of Terms have been agreed for land swaps and/or compensation with all tenants and landowners, and in some cases, agreements have been finalised.

3.7.24. The Applicant has taken advice from concerned non-agricultural businesses during the scheme design and statutory consultation phases, and has amended the Proposed Development's design over that period to help to avoid, reduce and/or minimise the potential for noise and accessibility effects perceived by these businesses. In order to limit disruption, the Applicant has:

- Removed the option consulted on previously for a substation or BESS to be included on Field 23 (which will now be a field of solar panels), thereby reducing maximum operational noise levels/effects and providing more opportunity for corridors for grazing animals to pass through;
- Removed a potential construction compound siting zone from the area between Parcels 2 and 3 to ensure continuity of access by an existing non-agricultural tenant; and
- Confirmed and secured in the **Design Commitments [EN010158/APP/5.9]** that at the detailed design stage, the solar panel arrangement for Field E23 will be designed to incorporate movement corridors for sheep and/or horses to cross the field to access their other adjacent grazing fields.

3.7.25. The significance of this effect on people and businesses working in the agricultural and supporting (non-agricultural) sectors is reported as **slight adverse** and **not significant**.

3.7.26. The positive socio-economic effects of the Proposed Development are reported in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]**, which sets out that:

- The Proposed Development will support operational employment over the anticipated long-term, temporary operation (including maintenance) phase.
- The Applicant estimates that the operation (including maintenance) phase would support around 24 FTE jobs, with additional staff attending when required for maintenance, replacement of faulty or end of service life solar equipment, vegetation management activities and cleaning.
- The employment supported would include electrical engineering roles likely to require higher level skills and qualifications, as well as site management, administrative and process/elementary occupations including security and maintenance.

3.7.27. The significance of this effect is reported as **neutral/slight beneficial**.

3.7.28. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 4**], this assessment of a non-significant effect takes account of:

- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Approach to Design and Mitigation/Enhancement

3.7.29. As set out above, mitigation for the potential effects on agricultural and non-agricultural employment and business viability within the Order Limits would be mitigated (or compensated for) through the development of financial compensation and/or land swaps in order to provide continuity for employment and socio-economic activity where practicable.

3.7.30. The Applicant has engaged with landowners and tenants closely during the pre-application period, and in some cases secured changes to the design to ensure that existing businesses are not unduly affected by environmental or accessibility changes.

3.7.31. To help maximise the positive gain for the local economy from the beneficial effect arising from employment generation during the construction and operation (including maintenance) phase, an **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14]** supports the DCO Application.

3.7.32. This details commitments to work with partners and the local and regional construction supply chain to enhance the proportion of activities that can be accessed by local people (both in employment, unemployed and economically inactive or outside of the current labour market) and firms with relevant experience and competencies.

3.7.33. The main objectives of the **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14]** are cognisant of and informed by regional and local policy and strategy for employment and skills as detailed in published documents by the Council, with these joint objectives detailed below:

- Promote opportunities for people who are employed, unemployed and economically active and young people who are Not in Education, Employment or Training (NEET) to access employment and skills development opportunities;
- Create opportunities for businesses to tender for work and join the supply chain of the Proposed Development;
- Clearly define the workforce, skills and supply chain requirements of the Proposed Development and articulate these in a clear and timely way to relevant stakeholders involved at a County- and Regional-level in supporting education, access to employment, skills development and business engagement;
- Harness the motivational potential of the Proposed Development to inspire the next generation of talent, particularly, to confidently invest in a career and future in Buckinghamshire, benefitting all employers; and
- Contribute to an evidence base to support the planning and delivery of education and skills curriculum and training capable of delivering the workforce and skills needed across the County and wider Region, at the right time, to support the business competitiveness of all energy and construction projects.

3.7.34. This is in line with the objectives referenced within the 'Draft Vision and Objectives' Document for the Draft Buckinghamshire Local Plan **[Ref. 17]**, which highlights the need to ensure that the right infrastructure is provided for health, education, skills and training. The Buckinghamshire Vision **[Ref. 16]** also references the current challenges that Buckinghamshire are facing in regards to areas of deprivation with high levels of unemployment, which the Proposed Development will contribute to addressing through this Outline Employment, Skills and Supply Chain Plan.

3.7.35. Through this enhancement strategy, existing workers and firms may be able to up/re-skill to the benefit of the Proposed Development but also supporting their own career development and strategic policy objectives to improve the skills base in green construction sectors that will aid future cumulative demand for similar skills across the region's renewable energy sector.

3.8. Other Health Determinants and Pathways considered within the Application

Glint and Glare (Operational Phase)

3.8.1. Glint and Glare has the potential to cause visual disturbance which could result in poor visual amenity. This is often associated with increased stress and an overall diminished quality of life. .

3.8.2. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who may spend more time at homes in close proximity to the Order Limits.

3.8.3. Solar PV modules are specifically designed to absorb light rather than reflect it. Light reflecting from Solar PV modules results in the loss of energy output. Solar PV modules are dark in colour due to their anti-reflective coatings and are manufactured with low-iron, ultra-clear glass with specialised coatings and textures to enable maximum absorption. The combination of these factors significantly increases electrical energy production of the panels and at the same time significantly reduces reflected rays.

3.8.4. As set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]**, the Planning Inspectorate has agreed that glint and glare can be scoped out of the ES assessment.

3.8.5. However, in recognition of the potential for health pathways (and nuisance potential for people living in nearby residential properties), a glint and glare assessment has been undertaken, as presented in **ES Volume 4, Appendix 5.4: Glint and Glare Assessment [EN010158/APP/6.4]**. The Glint and Glare Assessment outlines the assessment methodology and the likely extent and distance of potential glint and glare.

3.8.6. Mitigation to reduce the glint and glare potential impacts, in the form of planting, is embedded within the design and is presented within **Outline LEMP Appendix 1 – Green and Blue Infrastructure Parameters [EN010158/APP/7.6]**.

3.8.7. Overall, the assessment considers sensitive receptors around the Site including users of roads, railway and PRoW, and residents/users of buildings including homes and community facilities. Embedded mitigation, consisting of vegetation screening 3m AGL, has been included within the assessment.

3.8.8. The assessment results conclude that the Proposed Development will only have **low** impact on certain identified sensitive receptors, and all effects are predicted to be **not significant**. Cumulative effects from nearby solar projects are also predicted to be **not significant**.

3.8.9. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 2**], this assessment of a non-significant effect takes account of:

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards (where applicable, noting that such guidance does not exist for the effects of glint and glare on bridleways, public rights of way (PRoW) or fields with grazing animals);
- There being likely to be at most a small or negligible change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Electromagnetic Fields & Radiation (including heat) (Operational Phase)

3.8.10. As highlighted by the World Health Organization (WHO), electromagnetic field fields can be defined as physical fields that represents both the electric (created through differences in voltage) and magnetic (created when electric current flows) influences.

3.8.11. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Electro-magnetic radiation.

3.8.12. The majority of underground cabling within the Site to facilitate the connection between the Solar PV modules, Balance of Solar System (BoSS), Satellite Collector Compounds, BESS and Rosefield Substation would be up to 132kV, apart from the section of 400kV underground

cabling which would connect the Rosefield Substation to the National Grid East Claydon Substation.

3.8.13. **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]** proposed to scope out EMF as the 400kV underground cable that would be required to connect the Rosefield Substation and National Grid East Claydon Substation would be minimal in length. This approach was agreed within **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]** on the basis that in-combination impacts with the overhead lines on human health should be considered and significant effects assessed where they are likely to occur.

3.8.14. The 400kV underground cabling would be buried within trenches, with each up to 2m in width and approximately 1.5m in depth and would be sited at a distance of approximately 500m from the nearest sensitive receptors. This is designed in accordance with the relevant guidance (DECC Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice 2012) [**Ref. 41**] and secured in the **Design Commitments [EN010158/APP/5.9].**

3.8.15. In accordance with the Technical Advice Page for Scoping Solar Development [**Ref. 42**], a standalone EMF study has been undertaken and is presented in **ES Volume 4, Appendix 5.6: EMF Assessment (Electromagnetic Field Assessment - non critical) [EN010158/APP/6.4]**.

3.8.16. The study sets out the proposed siting zone for the cabling and includes an assessment of EMF for underground cabling and the Rosefield transformers. The assessment recommends a minimum clearance distance of 25m to human receptors relative to public exposure limits for magnetic and electric fields which is secured in the **Works Plans [EN010158/APP/2.3]** and concludes that there would be no effects to sensitive receptors.

3.8.17. The Planning Inspectorate agreed (as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]**) that heat and radiation should be scoped out of the ES assessment, on the basis that it is not anticipated that there would be any significant sources of heat or radiation during either construction, operation (including maintenance) or decommissioning.

3.8.18. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 4**], this assessment of a non-significant effect takes account of:

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds, guidance or statutory standards;

- There being likely to be at most a small (or negligible) change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes;
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

Major Accidents and Disasters

3.8.19. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Community safety and crime;
- (Electromagnetic) radiation;
- Air quality; and
- Water quality or availability.

3.8.20. The Planning Inspectorate agreed (as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]**) that major accidents and disasters should be scoped out of the assessment, on the basis that by implementing recognised and approved safety legislation and regulation, no significant effects in relation to major accidents and disasters are anticipated during the construction, operation (including maintenance) and decommissioning phases.

3.8.21. However, the impacts of major accidents and disasters are considered within the **BESS Plume Assessment Summary [EN010158/APP/7.13]**, **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**, **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2]** and **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2]**, with any relevant mitigation measures secured within the **Outline CEMP [EN010158/APP/7.2]**, **Outline OEMP [EN010158/APP/7.3]** and **Outline Battery Safety Management Plan (oBSMP) [EN010158/APP/7.9]** which are submitted in support of the DCO Application.

Battery Failure/Plume Assessment/Fire

3.8.22. The Applicant is committed to developing a safe BESS facility that would provide long and dependable operation. It is in everyone's interest that the selected BESS technology is robust, in particular with regards to safe operation.

3.8.23. The Applicant has undertaken a **BESS Plume Assessment Summary [EN010158/APP/7.13]** to assess the possible impacts in an emergency situation to receptors of the BESS in acknowledgement that there may be

concern regarding the potential thermal runaway (where a battery cell enters an uncontrolled self-heating state).

3.8.24. The Applicant has consulted the UK Health Security Agency (UKHSA) on the methodology for the assessment, and both parties agree that at the detailed design phase a plume assessment would be commissioned based on atmospheric dispersion modelling; this would give an understanding of what would be emitted and the impact in comparison with air quality standards (in terms of health pathways).

3.8.25. The **BESS Plume Assessment Summary [EN010158/APP/7.13]** has considered the potential impacts from all types of battery failures, finding that in the occurrence of credible worst-case scenarios, nearby receptors are likely to remain unaffected relative to thresholds outlined in existing guidance. The summary states that any plume arising from a BESS fire from any type of battery failure would dissipate before reaching any sensitive receptors.

3.8.26. It sets out that arrangement and placement of the example design ensures receptors sensitive to the types of emergency situations associated with BESS failure are largely protected prior to implementation of specific emergency response planning or control systems, and deployment of these will only increase protection in these eventualities.

3.8.27. However, to ensure safe management of emergency situations by onsite workers and emergency responders, an Emergency Response Plan will be developed and deployed prior to construction of the BESS facility.

3.8.28. Overall, the Applicant considers that the **BESS Plume Assessment Summary [EN010158/APP/7.13]** provides and demonstrates a deep understanding of the risks of building and operating a large scale battery storage installation. It demonstrates that under day-to-day operation there is a low risk of an incident, and in the event of an incident the credible hazards are understood and have been evaluated at this concept design stage to demonstrate that the risk to the local population remains very low.

3.8.29. As such, in terms of health pathways and determinants, the assessment provides important assurance to the general public as to the agreed position on assessment of risks, which provides an improved sense of control to avoid or reduce the potential for anxiety relating to mental health and wellbeing.

3.8.30. The Applicant has included an **Outline Battery Safety Management Plan (BSMP) [EN010158/APP/7.9]** within the DCO Application, which sets out the key fire safety provisions for the Battery Energy Storage System (BESS) proposed to be installed at the Proposed Development including measures to reduce fire risk and fire protection measures. This Plan has three important implications in terms of health pathways:

- Ensuring that there is visibility and oversight of health and safety measures in collaboration with stakeholders with an interest or statutory responsibility for public health (such as the UK Health Security Agency (UKHSA) and Buckinghamshire Fire Authority);
- Providing security for the delivery of detailed plans and measures to reduce the risk of fire and other potential effects related to BESS on physical health and wellbeing; and
- Providing clarity and reassurance of the safety and security of design decisions (such as location and layout of the BESS), procedures (e.g. procurement, monitoring and testing) and elements (such as access arrangements for emergency vehicles) of the Proposed Development which, through consultation and engagement, are considered to raise anxiety and stress in the community, thereby helping to address concerns relating to mental health and wellbeing.

3.8.31. **Section 3** of the **Outline BSMP [EN010158/APP/7.9]** (as well as the **Consultation Report [EN010158/APP/5.1]**) sets out how the Plan has evolved through consultation feedback from local consultees (including parish councils).

3.8.32. The **Outline BSMP [EN010158/APP/7.9]** demonstrates that as well as the Applicant having significant internal expertise and robust processes in BESS development, the relevant stakeholders have been consulted and their responses have informed the design of the Proposed Development, and therefore safety would be inherent in the overall design, minimising the risk of a fire event occurring, and reducing the impact of such an event should it occur.

3.8.33. This **Outline BSMP [EN010158/APP/7.9]** provides a clear list of pre-construction information requirements (Section 5) to enable the Applicant to demonstrate prior to construction that the Proposed Development would be implemented and operated safely

Land and Water Contamination

3.8.34. **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2]** presents an assessment of the likely significant effects arising during the construction, operation (including maintenance) and decommissioning phases of the Proposed Development on the water environment.

3.8.35. The chapter suggests that construction activities, the operation of equipment during the construction phase and operational activities have the potential to locally alter both flood risk and surface water drainage pathways, which could lead to environmental disaster.

3.8.36. In addition to this, construction activities, operational activities and the operation of equipment during the construction and decommissioning

phase also have the potential to increase slit/pollutants entering surface water courses, which could have a negative impact on the overall water quality of the local watercourse.

3.8.37. The proposals include various embedded mitigation measures in order to successfully integrate the Proposed Development within the context of the existing landscape and the water environment, while preventing adverse effects on ecological features. These measures include:

- Perimeter fencing surrounding the Solar PV development would be offset by at least 10m either side from all existing ditches (where crossings are not required) to provide a buffer for any buffer entrained surface water runoff, as secured within the **Design Commitments [EN010158/APP/5.9]**;
- an **Outline Drainage Strategy [EN010158/APP/7.11]** which includes design measures for SuDS features and details the principles for ensuring firewater runoff is retained within BESS compound;
- Vegetation management to ensure kinetic energy from rainfall run off is dispersed to reduce the risk of soil erosion as outlined in the **Outline Landscape and Ecological Management Plan [EN010158/APP/7.6]**;
- Construction compounds being at least 10m from watercourses as secured in the **Works Plans [EN010158/APP/2.3]**;
- Vegetation buffers including a 30m biodiversity enhancement buffer between the Solar PV development and a 400m buffer to Finmere Wood SSSI as secured in the **Works Plans [EN010158/APP/2.3]**; and

3.8.38. Relevant mitigation measures are secured within the following documents which are submitted in support of the Development Consent Order Application:

- **Outline CEMP [EN010158/APP/7.2]**
- **Outline OEMP [EN010158/APP/7.3]**
- **Outline DEMP [EN010158/APP/7.4]**
- **Outline Drainage Strategy [EN010158/APP/7.11]**

3.8.39. Measures within these management plans and strategies, and the embedded mitigation measures listed above suggest that residual effects on all receptors would be minor adverse, and therefore, not significant.

3.8.40. The potential for human health to be affected by contamination of land and water (for example from spills, refuelling or mobilisation of contamination during construction, operation (including maintenance) and decommissioning activities) is reported in **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2]**.

3.8.41. That assessment considers that:

- Construction and decommissioning activities could lead to localised contamination of soils from potential spills from the operation of construction plant or refuelling activities. If contaminated soils associated with past developments are identified, these could form a localised source of contamination if they are not managed correctly. There is the potential for contamination to affect human health and groundwater quality; and
- Operation (including maintenance) works could result in spillages and leaks of fuels, oils and chemicals, which could affect the near-surface soil and shallow geological units. Large numbers of vehicle movements are not anticipated within the Site during the operation (including maintenance) phase, so occurrences of accidental spillages are less likely during this phase than the construction phase. There is the potential for contamination to affect human health and groundwater quality if these receptors come into contact with spillages or leaks of fuels, oils or chemicals.

3.8.42. It is important to note that with the site history indicating that land use has been predominantly agricultural, contamination may already exist which is associated with agriculture. This contamination could be due to the application of herbicides, pesticides and fertilisers, or due to leaks or spillages from agricultural machinery.

3.8.43. Embedded mitigation will be in-place to reduce the risk of adverse health effects, and this will be secured by the **Design Commitments [EN010158/APP/5.9]** and the **Outline Drainage Strategy [EN010158/APP/7.11].**

3.8.44. Additional mitigation measures will also be secured, including the **Outline CEMP [EN010158/APP/7.2]** and **Outline OEMP [EN010158/APP/7.3]** to set out measures to avoid damage to human health due to contamination, and to avoid, minimise or mitigate effects on the environment during construction works and operational (including maintenance) activity. This includes managing risks from former agricultural activities such as foot and mouth burial pits, waste pits, pesticides and asbestos containing material, ensuring that land and groundwater receptors are protected from effects of contamination associated with historical usage of the land.

3.8.45. Following the consideration of both embedded and additional mitigation, **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2]** concludes that there is a **slight adverse** or **neutral** effect on human health relating to contamination. The residual effect is **not significant.**

3.8.46. In terms of health-specific effects, based on the approach as set out through IEMA Guidance [**Ref. 2**], this assessment of a non-significant effect takes account of:

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

3.9. Climate Change and Adaptation

3.9.1. Health pathways linked to climate may include direct, tangible effects such as increased exposure to extreme weather events due to climate change, and mental health and wellbeing effects linked to 'climate anxiety'. There is emerging evidence suggesting that increased awareness of climate change is contributing to anxiety and other mental health concerns, particularly among children **[Ref. 43]**

3.9.2. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Climate change and adaptation.

3.9.3. **ES Volume 2, Chapter 8: Climate [EN010158/APP/6.2]** assess the impacts of the Proposed Development in relation to climate change. The assessment concludes that there would be no significant adverse effects. As a result of this, it can be concluded that effects on human health are unlikely to be significant.

3.9.4. Over the proposed 40-year lifetime, the operation of the Proposed Development results in GHG savings of over 3 million tonnes CO_2e when compared to Combined Cycle Gas Turbine-generated electricity.

3.9.5. The renewable energy generation of the Proposed Development, and comparative carbon reduction compared to non-renewable methods, will have a positive effect on the climate.

3.9.6. In regard to the overwhelming national need set out in NPS EN-1 for the UK to transition to low carbon, sustainable forms of energy, it is likely that the Proposed Development would contribute to reduced anxiety amongst the general population concerned about climate change.

4. In-combination (Intra-Project) and Cumulative (Inter-Project) Effects

4.1. The Applicant's Approach

4.1.1. As set out in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act in combination. The following types of cumulative effects have been considered in accordance with Environmental Impact Assessment (EIA) Regulations and best practice guidance:

- **Intra-project combined** effects – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor; and
- **Inter-project cumulative** effects – the combined residual (post mitigation) effects of the Proposed Development and 'other existing development and/or approved development' on a single receptor/resource.

4.1.2. Regulation 5(2) of the EIA Regulations [**Ref. 44**] states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and the landscape.

4.2. In-combination/Intra-project effects

4.2.1. The IEMA *Guide to Determining Significance for Human Health (November 2022)* [**Ref. 4**] suggests that **in-combination** effects (also known as **intra-project** effects) should be determined, and that this requires collating the effects identified (excluding negligible effects) for each determinant of health by population or subpopulation(s).

4.2.2. The IEMA *Effective Scoping of Human Health in EIA Guidance (July 2022)* [**Ref. 3**] provides advice that assessments should provide a narrative of likely interactions, and if appropriate a professional judgement as to a combined significance conclusion for a population or sub-population.

4.2.3. This may include multiple significance conclusions, for example one combining positive effects and one combining negative effects, and may then feed into a description of the appropriate mitigation.

4.2.4. The guidance also notes that:

- Interactions between determinants of health are complex as the changes may affect either the same or different risk factors; and independently, the same or different health outcomes;
- Whilst overlaps in health determinants occur, positive and negative health effects usually don't cancel each other out; and
- Similarly (and importantly), positives or negatives do not necessarily reinforce each other in combination - clearly stating whether a population experiences an overlap in effects from a range of determinants of health is usually more appropriate than calculating a net effect on public health.

4.2.5. For the Proposed Development, in-combination effects have been assessed in each of the relevant ES chapters (**ES Volume 2, Chapters 6 – 16**) in compliance with paragraph 5(2)(a) to (d) of the EIA Regulations 2017 [**Ref. 44**].

4.2.6. A review of the sensitive receptor (or sensitive receptor group) identified in each technical chapter, and whether the same receptor is exposed to more than one type of residual (post-additional mitigation) effect of 'slight/minor' significance or greater, during the construction, operation (including maintenance) and/or decommissioning phases of the Proposed Development has been completed. This has been undertaken using each of the summary tables presented in the final sections of relevant environmental topic assessments in **ES Volume 2**.

4.2.7. Mitigation measures have been identified in each individual chapter to minimise the individual effects, which will be secured through the implementation of relevant management plans and strategies.

4.2.8. **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** has identified no heath-relevant receptors are likely to experience in-combination / intra-combination significant effects during construction.

4.2.9. However, engagement and consultation has resulted in the understanding that members of the community are concerned about the potential for general change in access and environmental amenity of public spaces (PRoW) during both the construction and operational (including maintenance) phases, which may have the potential to cause people to avoid using PRoW or reduce their enjoyment of those PRoW for recreation, leading to a detriment in terms of physical and mental wellbeing.

4.2.10. Following the consideration of embedded and additional mitigation, during the construction phase, users of PRoW will experience:

- **Negligible** to **minor adverse** (**not significant**) effects relating to noise and air quality - changes in amenity of PRoW would be limited spatially, and transitory;
- At most **negligible adverse** (**not significant**) effects in terms of severance, non-motorised user amenity and fear and intimidation;
- **non-significant effects** (**negligible** or **minor/minor to moderate adverse**) for seven PRoWs (including NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring);
- **Significant effects** (**moderate or moderate/major adverse**) for six PRoW (including North Buckinghamshire Way/Midshires Way, Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3); and
- **Slight adverse** residual effect on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant**.

4.2.11. Several measures will be in place that would help to minimise disruption to community access across and within the Order Limits during construction, in addition to proposed temporary and permanent diversions.

4.2.12. These include measures within **Section 6** of the **Outline CTMP [EN010158/APP/7.5]** (On-Site Access Management Proposals) to limit disruption to users of PRoW and permissive paths, provide information and correct any damage caused by construction activity, and ensure safety of users. New signage and/or waymarking will be provided along diverted PRoW and permissive footpaths.

4.2.13. Following the consideration of embedded and additional mitigation, during the operational (including maintenance) phase, users of PRoW will experience:

- **Negligible** to **minor adverse** (not significant) effects relating to noise and air quality;
- **Negligible effects** in terms of severance, non-motorised user amenity and fear and intimidation) (operational (including maintenance) phase were scoped out of the assessment as a result of being unlikely to give rise to greater than **negligible** effects);
- **Non-significant effects** (**negligible** or **minor/minor to moderate adverse**) for eight PRoWs (including North Buckinghamshire

Way/Midshires Way, NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring);

- **Significant effects** (**moderate or moderate/major adverse**) for five PRoW (including Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3); and
- **Slight beneficial** effects on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant -** the creation of new permissive paths would also increase community accessibility and recreational opportunities in an area that is currently inaccessible. The routes would improve community connectivity between the existing public highway and community areas such as East Claydon, Middle Claydon and Botolph Claydon in the east and Calvert in the west.

4.2.14. It is recognised that experience of the natural environment through recreational and other use of PRoW is an important aspect contributing to mental and physical health and wellbeing.

4.2.15. The Applicant has proposed mitigation for the above effects through management plans and embedded mitigation described in each individual assessment listed above, in order to reduce as far as is practicable the potential for adverse effects.

4.2.16. As set out in the previous section, at the operational phase, a number of new PRoW and permissive paths will also be in place to enhance the user experience and maximise accessibility, albeit within a different visual environment.

4.2.17. As such, in terms of the health determinant / pathways relevant to the effects on amenity and recreational use of PRoW (see **Table 1**), the Applicant considers that:

- Effects during the construction phase are temporary, short-term and managed where practicable through embedded mitigation and management plans – the Proposed Development has been carefully designed through consultation to provide physical mitigation for potential changes to amenity;
- While there would be some short-term closures and disruption, this is limited and well managed and communicated, and is within the context of wider accessibility of routes in the local area and diversions that would be provided by the Applicant;

- Following construction, there would be long-term improvements in accessibility within the local area and across the Site.

4.3. Cumulative/Inter-Project Effects

4.3.1. The IEMA *Guide to Determining Significance for Human Health (November 2022)* [**Ref. 4**] suggests that the level of cumulative effects (also known as **inter-project** effects) should be determined.

4.3.2. This means, for each determinant of health (or health pathway), listing the relevant reasonably foreseeable cumulative projects and using professional judgement (further sensitivity analysis is not required as the receptor remains the same, however magnitude should be appraised in light of the combined effect), providing a combined level of effect to reflect the likely implications for public health.

4.3.3. The priority is the identification of likely significant effects and the identification and description of any further mitigation necessary.

4.3.4. The guidance notes that:

- A combined public health effect is most likely where a population is affected by multiple determinants of health and a large proportion of the same individuals within that population experience the combination of effects.
- Some impacts are relatively localised, e.g., dust from a construction site, whilst others may be more far-reaching, e.g., job creation or noise along shared transport corridors.

4.3.5. The guidance also notes that an element of the cumulative assessment should articulate where a project contributes to a trend of incremental additional pressures on public health that whilst individually is not significant, collectively gives rise to significant public health effects.

4.3.6. For Rosefield Solar, an assessment of the **inter-project cumulative effects** with other existing development and/or approved developments, which includes East Claydon BESS (ID No.1), East Claydon Greener Grid Park (ID No.2), Tuckley Solar Farm (Id No. 3), HS2 (ID No. 5), Calvert Solar Farm (ID No. 7), East West Rail (ID No. 8) and Longbreach Solar Farm (ID No. 9),

4.3.7. National Grid East Claydon Substation, Rookery Farm BESS, Statkraft Greener Grid Park, Tuckey Solar Farm, HS2 and Calvert Solar Farm as presented in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**. This assessment considers the potential combined impacts of the Proposed Development alongside other nearby projects and outlines that no significant residual inter-project cumulative effects are

anticipated, assuming the other developments have adequate mitigation in place.

4.3.8. Inter-Project Effects are considered in Sections 17.6 and 17.7 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**, in addition to within Tables 17.4, 17.7, 17.8 and 17.9.

4.3.9. Section 17.6 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** focuses on interactions between the Proposed Development and National Grid East Claydon Substation, while **Section 17.7** shows cumulative socio-economic effects (relating to employment and economic activity including effects on construction, energy and agricultural and tourism sectors) at the population/economic scale[3].

4.3.10. The assessment considers the individual environmental effects that may have the potential to influence health pathways, for example – air quality, noise, transport and access, and socio-economics – that may have the potential to result in significant cumulative effects.

4.3.11. The following summarises the cumulative effects, receptors and Zones of Influence (ZoIs) relevant to determinants of health/health pathways reported in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2].**

Air Quality

4.3.12. The Zone of Influence (ZoI) for air quality is 250m from the Order Limits, influenced by the study area for human receptors for demolition, earthworks and general construction activities and based on the Institute of Air Quality Management (IAQM) construction dust guidance. This guidance inherently considers thresholds for effects on human health. As a result, the potential for cumulative effects on receptors is spatially limited.

4.3.13. The cumulative assessment considers the potential for construction phase effects from dust and particulate matter emissions from Site activities, including the operation of the construction equipment, and effects from road traffic exhaust emissions during construction operation.

4.3.14. The assessment in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects**

[3] 'population' effects should not be conflated with inter-project effects on population receptors (people, property and communities, community facilities etc) which are inherently the same receptors as considered through cumulative effects for individual environmental topics

[EN010158/APP/6.2] Table 17.4] for air quality human health impacts, there is a low of negligible risk for every activity.

4.3.15. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** paragraphs 17.7.1 to 17.78), it is noted that the predicted cumulative construction phase Light Duty Vehicles generation slightly exceeds the Environmental Protection UK and IAQM 2017 guidance.

4.3.16. In spite of these exceedances, based on the review of the baseline conditions, annual mean NO_2 and PM_{10} concentrations at the Site will be well below Air Quality Standards, with there being a minimal number of high street sensitive receptors being located close to affected roads. Traffic effects during construction and decommissioning will be limited to a short period at each phase, while all short listed development are expected to have a detailed CTMP to control road traffic exhaust emissions.

4.3.17. It is important to note that impacts on Local Wildlife Sites (LWSs) are of particular relevance to human health, with these sites hosting rich biodiversity that can contribute to the pollination of crops, pest control and air/water purification, which can improve food security and mitigate against climate change. Access to these spaces can also reduce stress and anxiety, in addition to increasing physical activity.

4.3.18. In summary, the Proposed Development and all other short listed developments are not expected to generate traffic that exceeds the Design Manual for Roads and Bridges LA 105 Air Quality screening criteria[4] on any construction or decommissioning traffic route within 200m of Local Wildlife Sites (LWSs).

4.3.19. Due to this, it is unlikely that the additional cumulative construction and decommissioning traffic emissions from the Proposed Development and all other shortlisted development would cause significant adverse effects at LWSs. This suggests that with appropriate mitigation in place (as secured **in Outline CEMP [EN010158/APP/7.2]**, the **Outline CTMP [EN010158/APP/7.5]** and the **Outline DEMP [EN010158/APP/7.4]**), construction and decommissioning phase inter-project cumulative effects on air quality as a determinant of human health would not be significant.

4.3.20. With the Proposed Development and all short listed development not expected to generate traffic exceeding the relevant Design Manual for Roads and Bridges LA 105 Air Quality screening criteria once operational,

[4] Light Duty Vehicles equal to or more than 1,000 Annual Average Daily Traffic or Heavy Duty Vehicles equal to or more than 200 Annual Average Daily Traffic

and all committed development expected to follow best practice mitigation measures, the cumulative effect on air quality as a determinant within the operational phase will not be significant. Mitigation for both the Proposed Development and other committed developments would include site-specific Operational Environmental Management Plans (OEMPs) to minimise road traffic exhaust emissions.

4.3.21. As a result of this, it can be confirmed that any cumulative/inter-project effects related would not worsen air quality to a degree that would have significant harm on human health.

Noise and Vibration

4.3.22. The ZoI for noise and vibration is 300m from the Order Limits, determined by guidance set out in BS 5228-1: 2009+A1: 2014 and BS 5228-2: 2009+A1: 2014.

4.3.23. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (See Table 17.4 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**), no inter-project cumulative effects during the construction and operational (including maintenance) phases are anticipated.

4.3.24. When considering noise and vibration as a common receptor, the inter-project cumulative effect is expected to be a minor adverse at Sion Hill Farm, suggesting that noise levels would not exceed the low magnitude of impact criteria at the surrounding receptors. It is concluded that provided there is adequate mitigation for National Grid East Claydon Substation, residual inter-project cumulative effects would **not be significant**.

4.3.25. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** paragraphs 17.7.396 to 17.7.411), East Claydon BESS, Tuckey Farm Solar, Calvert Solar Park and HS2 (and associated developments) are identified as developments that have the potential to act cumulatively with the Proposed Development.

4.3.26. When looking at the **East Claydon BESS** development, the ES chapter prepared for this development suggested that the predicted noise levels from construction works at Sion Hill Farm would be lower than the daytime significance threshold of 65 dB $L_{Aeq,T}$, while construction activities for the Proposed Development would take place closer to Sion Hill Farm, and would in turn generate higher levels of daytime noise when compared to the **East Claydon BESS**. As a result, the cumulative construction noise effects would not be greater than the Proposed Development in isolation.

4.3.27. In addition to this, when considering the predicted daytime and night-time operational noise levels cumulatively for **East Claydon BESS** and the Proposed Development, the resultant inter-project cumulative noise levels would constitute a direct, permanent, minor adverse effect that would **not be significant**.

4.3.28. With regards to **Tuckey Farm Solar**, as a result of the location of noise emitting infrastructure associated with this development, resultant noise levels at receptors considered within the assessment for the Proposed Development would be so low that they would not act cumulatively. Due to this, the inter-project cumulative effects are **not significant**.

4.3.29. Despite **Calvert Solar Park** not having a noise impact assessment report, the Planning, Design and Access Statement suggests that emitted operational noise levels would be "low and unlikely to be discernible by local residents". With noise emitting equipment associated with **Calvert Solar Park** being situated in the south-western extents of the application site, result noise levels at receptors considered within the assessment for the Proposed Development would be at a sufficiently low level that they would not act cumulatively (**non-significant inter-project effect**).

4.3.30. For noise sensitive receptors in the vicinity of **HS2**, the predicted operation (including maintenance) phase noise levels from the Proposed Development are predicted to be considerably lower than the noise generated by HS2, resulting in a **non-significant inter-project cumulative effect**.

4.3.31. In summary, no likely significant effects are predicted during the operational (including maintenance) phase of the Proposed Development, and hence the Applicant considers that inter-project cumulative effects are not significant.

Landscape and Visual Effects

4.3.32. The ZoI for landscape and visual effects is set at 10km from the Order Limits for the Proposed Development, in order to capture the likely interaction between views of multiple projects by receptors that include users of linear routes (including PRoW) and residential properties.

4.3.33. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (see paragraphs 17.6.9 to 17.6.115 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**).

4.3.34. The assessment concludes that:

- The only locations where there would be views of both developments at the same time would be from a section of Winslow Road/East Claydon

Road and from sections of the PRoW network between East Claydon/East Claydon Road and to within Parcel 3 (incorporating PRoWs ECL/3/1, ECL/3/2, ECL/3A/1, ECL/4/1, ECL/4/2, ECL/5/1, ECL/6/1).

- Residential properties at Sion Hill Farm and Station House would potentially have the combined views of the Proposed Development and the National Grid East Claydon Substation development.
- If both the Proposed Development and the National Grid East Claydon Substation were operational in combination, this would result in limited additional views from the first floor of the Sion Hill Farm, resulting in inter-project effects being a major adverse at Years 1 and 10 of operation (**significant**).
- If both the Proposed Development and the National Grid East Claydon Substation were operational in combination, this would result in a substantial increase in the scale of effects resulting from near distance views of the National Grid East Claydon Substation development. In Year 1, large scale effects would therefore result in a substantial magnitude of effect on visual amenity, creating a major adverse inter-project cumulative effect (significant) at Station House. In light of additional mitigation being secured within the **Outline LEMP [EN010158/APP/7.6]** such as perimeter fencing for the Proposed Development being regularly checked, new hedgerow planting throughout the Order Limits to provide screening and biodiversity benefits and the control of litter/vandalism , it is expected that there would be a medium scale of change resulting in a substantial moderate effect on visual amenity.
- As a result, the inter-project cumulative effect of the National Grid East Claydon Substation being developed in combination with the Proposed Development would be major/moderate at Year 10 (**significant**).
- In regards to PRoW, in the scenario that the National Grid East Claydon Substation development is operational in combination with the Proposed Development, large scale effects on views would extend further north approximately up to Winslow Road/East Claydon Road. The assessment concludes that inter-project effects in PRoW for both Years 1 (major adverse) and 10 (moderate adverse due to additional mitigation in the form of **Outline LEMP [EN010158/APP/7.6]**) would be **significant**.

4.3.35. The inter-project cumulative effects assessment for Landscape and Visual is provided in Table 17.9 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**, which considers the cumulative effect of the Proposed Development with 19 others.

4.3.36. The assessment concludes that there would significant cumulative effects from the following developments on receptors assessed within **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2]**:

- **National Grid East Claydon Substation** – moderate adverse effect in within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, LCA 7.3: Claydon Bowl, North Buckinghamshire Way and The Midshires Way, Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood, PRoW between East Claydon/East Claydon Road and to within Parcel 3;
- **East Claydon BESS (23/03875/APP)** – moderate adverse effect within the construction and decommissioning phases on PRoW between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road, and moderate adverse effects within the construction, decommissioning and operational phases on LCA 5.7: Hogshaw Claylands (Year 1 and Year 10), LCA 7.3: Claydon Bowl (Year 1 and Year 10), Granborough (Year 1 only), North Buckinghamshire Way and The Midshires Way (Year 1 only), Bernwood Jubilee Way (Years 1 and 10), PRoW between Botolph Claydon and Runt's Wood (Years 1 and 10), PRoW between East Claydon/East Claydon Road and to within Parcel 3 (Years 1 and 10) Sion Hill Farm (Years 1 and 10) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10);
- **East Claydon Greener Grid Park (25/01297/APP)** - moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood and PRoW between East Claydon/East Claydon Road and to within Parcel 3, and moderate adverse effects within the construction, decommissioning and operational phases on North Buckinghamshire Way and The Midshires Way (Year 1 only) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10);
- **Tuckley Solar Farm (19/00983/APP)** – moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, LCA 7.3: Claydon Bowl, Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood and PRoW between East Claydon/East Claydon Road and to within Parcel 3, and moderate adverse effects within the construction, decommissioning and operational phases on North Buckinghamshire Way and The Midshires Way (Year 1 only) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10);
- **East West Rail (25/00013/DCO)** – moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands and North Buckinghamshire Way and The Midshires Way , Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood and PRoW between East Claydon/East Claydon Road and to within Parcel 3, and moderate adverse effects within the construction,

decommissioning and operational (Year 1 and Year 10) phases on LCA 7.3: Claydon Bowl; and

- **Longbreach Solar Farm (25/01865/APP)** - moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, and moderate adverse effects within the construction, decommissioning and operational (Year 1 and Year 10) phases on LCA 5.7: Hogshaw Claylands, LCA 7.3: Claydon Bowl, North Buckinghamshire Way and The Midshires Way (Year 1 only), Bernwood Jubilee Way (Years 1 and 10), PRoW between Botolph Claydon and Runt's Wood (Years 1 and 10), PRoW between East Claydon/East Claydon Road and to within Parcel 3 (Years 1 and 10), Sion Hill Farm (Years 1 and 10) and
- Swan's Way/Outer Aylesbury Ring (Years 1 and 10);

4.3.37. When looking at residual cumulative effects of the six cumulative developments with the Proposed Development, significant residual cumulative effects are recorded at the following receptors:

- LCA 5.6: Claydon Valley (Operation – Years 1 and 10);
- LCA 5.7: Hogshaw Claylands (Construction, decommissioning and operation – Years 1 and 10);
- LCA 7.3: Claydon Bowl (Construction, decommissioning and operation – Years 1 and 10);
- Granborough (Construction and decommissioning);
- North Buckinghamshire Way and The Midshires Way (Construction, decommissioning and operation – Year 1);
- Swan's Way/Outer Aylesbury Ring (Operation – Years 1 and 10);
- Bernwood Jubilee Way (Construction, decommissioning and operation – Years 1 and 10);
- PRoW between Botolph Claydon and Runt's Wood (Construction, decommissioning and operation – Years 1 and 10);
- PRoW between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road (Construction and decommissioning);
- PRoW between East Claydon/East Claydon Road and to within Parcel 3 (Construction, decommissioning and operation – Years 1 and 10); and
- Sion Hill Farm (Operation – Years 1 and 10);

Effects on Traffic, Transport and Access

4.3.38. The ZoI for transport and access is defined as developments that result in significant traffic flows (in excess of 10%) that result in construction or operational traffic on the study area road network during the proposed construction period. This is due to the fact that projects that generate significant traffic on the study area that coincide with the Proposed Development may result in inter-project cumulative effects on the network.

4.3.39. In terms of the potential relevant effect of traffic and access effects on health pathways, the cumulative assessment considers potential effects on severance, pedestrian delay and Walking, Cycling and Horse rider (WCH) user amenity, fear and intimidation, accidents and road safety from traffic associated with the construction and operational phases.

4.3.40. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** suggests that the inter-project cumulative effect of the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** Table 17.4) on users of the road network and sensitive locations (e.g. schools, hospitals and residential areas with provision for walking and cycling) would not be significant due to the low number of AIL movements associated with the Proposed Development.

4.3.41. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** paragraphs 17.7.412 to 17.7.419) , there is potential for temporary construction related effects on all road users and sensitive locations (e.g., hospitals, schools, residential areas with provision for walking and cycling). Two committed developments have been identified where significant traffic flows could interact:

- 22/00125/REF: New Category C Prison, known at Grendon Springhill 2; and
- HS2.

4.3.42. When looking at Grendon Springhill 2, only operational traffic flows are provided, with it being assumed that the prison would be fully operational at the time of peak construction traffic generation. Despite this not taking account of the fact that planning conditions will need to be discharged and construction works will need to be started which could take some time, this provides a robust assessment scenario.

4.3.43. With 2029 HS2 traffic flows not being available, existing HS2 flows operating at the same time as the traffic surveys are used to provide a robust assessment.

4.3.44. Inter-project cumulative effects would occur on the A41 corridor, with no traffic from any other committed development appearing to use roads/routes[5] where the Proposed Development has the highest impact.

4.3.45. Inter-project cumulative effects of the AIL access route would be limited due to the small number of AIL movements, and with these movements set to be police escorted and subject to a specialist Transport Management Plan, the likely interactions with cumulative traffic flows and other road users are **naturally managed** or **avoided**.

4.3.46. The Proposed Development would include the following management plans relevant to health pathways for traffic and access effects to be avoided, reduced or managed:

- **Outline CEMP [EN010158/APP/7.2];**
- **Outline CTMP [EN010158/APP/7.5]; and**
- **Outline OEMP [EN010158/APP/7.3].**

Socio-economic Effects

4.3.47. The ZoI for population can be defined as the Community Study Area (as shown in **ES Volume 3, Figure 14.4: Community study area [EN010158/APP/6.3]**) and the Construction Labour Market Area (CLMA) Focus Area (as shown in **ES Volume 3, Figure 14.3: CLMA Focus Area [EN010158/APP/6.3]**). These areas are determined by the likelihood of receptors being identified as being affected by the Proposed Development within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]**.

4.3.48. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** suggests that the inter-project cumulative effects of the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** Table 17.4) on employment and contribution to GVA, agricultural economy, tourism and the tourist economy, and community access are **not significant**. Cumulative mitigation requirements are only needed for effects on employment and contribution to GVA, with the applicant committing to working with other developers where relevant through the **Outline Employment, Skills and Supply Chain Strategy [EN010158/APP/7.14]**.

4.3.49. Paragraphs 17.7.356 to 17.7.395 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** considers the likelihood for significant cumulative socio-economic effects on 'population' or 'socio-

[5] Station Road/Dewes Lane, Snake Lane/Fiddlers Field, Claydon Road or Granborough Road.

economic receptors' (e.g. effects relation to construction, economic activity, and adverse effects relating to agricultural employment capacity).

4.3.50. As set out in Table 17.10 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**, there are several solar and non-solar projects that are either currently in planning or under development that could have create inter-project employment and economic effects.

4.3.51. During the construction phase of the Proposed Development, inter-project cumulative effects may arise in-combination with other infrastructure projects (including NSIPs) likely to share similar construction skillsets and produce operational employment.

4.3.52. It is estimated that the cumulative solar projects could support:

- around **1,905** construction years of employment, **1,500** construction years of employment, resulting in an average of **190** temporary net full time equivalent jobs per year across the CLMA; and
- an average of 600 jobs supported by the Proposed Development (for 30-months).

4.3.53. This would temporarily create demand equivalent to **2.5%** of existing resident construction workers in the CLMA Focus Area, which would **not be significant**.

4.3.54. Based on standard GVA per workers rates and daily spending set out within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2]**, the cumulative solar projects would generate £28.7m per year in the form of GVA and £1m per year in the form of spending, contributing to 1.3% of the current construction GVA. In turn, the cumulative GVA/spend supported by construction is likely to result in **temporary, minor beneficial effect (not significant**).

4.3.55. When looking at inter-project temporary effects on tourist accommodation occupancy during construction and assuming that 50 construction workers use temporary accommodation when considered against the average number of bed spaces, it is likely that temporary accommodation providers would be able to cater for the tourist population in addition to any temporary construction staff during the construction period of all cumulative projects.

4.3.56. As a result, there is likely to be a temporary, slight residual effect on occupancy rates as a result of increased visitor numbers to the area. This could be a beneficial economic effect, but would **not be significant**.

4.3.57. As set out in Table 17.3 and Table 17.10 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**, there are several solar projects likely to be constructed and operated within Buckinghamshire that are

either currently in planning or under development, which are likely to lead to a reduction in the indicative employment capacity of agricultural land.

4.3.58. The cumulative projects comprise approx. 1,260 hectares of predominantly agricultural land, and when applying an average employment rate per ha in Buckinghamshire using Defra data, this land is projected to have cumulative indicative employment capacity for between 37-42 FTE jobs (accounting for 1.7% to 1.9% of employment capacity). With this identified to be a low magnitude of change upon the agricultural economy, inter-project cumulative effect would be a **temporary, long term, minor adverse (not significant)** effect on the agricultural economy.

4.3.59. There are mitigating factors to this cumulative effect which relate to health pathways, and mean that this estimated reduction is a 'worst case' assessment:

a) Any cumulative assessment of the potential impact on the agricultural economy is hypothetical and does not consider individual landowner agreements could safeguard the employment supported by landholdings by moving the employment and or productivity to a nearby site;

b) Any project developing on agricultural land would be subject to a consideration of statutory compensation relating to the operation of resident agricultural operations.

c) Uplift in other sectors (construction and energy – see below) will occur, which is a normal activity within any economy. Employment in these sectors will be supported by individual project commitments for promoting local skills and employment as required by NPS EN-1.

4.3.60. The Applicant has committed to an **Outline Skills, Employment and Supply Chain Plan [EN010158/APP/7.14]** which is secured as a Requirement of the **Draft DCO [EN010158/APP/3.1]**, and includes cumulative collaboration as a key tenet. It includes a commitment to contribute to an evidence base to support the planning and delivery of education and skills curricula and training capable of delivering the workforce and skills needed across the Region, at the right time, to support the business competitiveness of all energy and construction projects.

4.3.61. It is further anticipated that each individual NSIP would also produce similar strategies to enhance and promote local employment, skills and supply chain opportunities and as set out above the Applicant is keen to collaborate with developers, sectors and public and voluntary and community stakeholders in this regard.

Land and Water Contamination

4.3.62. The ZoI for land, soil and groundwater effects is 1km from the Order Limits, determined with regard to identifying land, soil and groundwater related receptors that could be impacted by the construction, operation (including maintenance) and/or decommissioning of the Proposed Development.

4.3.63. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** Table 17.4), the potential for risks to land contamination or effects on groundwater quality which may influence health pathways is not anticipated to be significant, assuming similar management plans are required to prevent contamination.

4.3.64. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments on water (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** paragraphs 17.7.420 to 17.7.422), there are six developments within 1km of the Order Limits considered to contribute to the potential for temporary construction related accidental spills to have a combined effect on groundwater.

4.3.65. The existence of mitigation plans and assessments agreed with relevant authorities suggests that inter-project effects on water in relation to accidental spill and/or slit runoff in the construction phase, and flood risk and water drainage in the construction, operational and decommissioning phases would **not be significant**.

4.3.66. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments on soil (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** paragraphs 17.7.31 to 17.7.44), there are six existing and/or approved developments within 1km of the Order Limits considered to contribute towards an increase in soil disturbance and reduction in agricultural land quality and productivity, with land set to be removed from agricultural production during the construction phase. In addition to this, soil will also be temporarily disturbed due to soil handling

4.3.67. Despite the methodology from 'A New Perspective on Land and Soil in Environmental Impact Assessment' **[Ref. 49]** suggesting that a permanent land loss of over 20ha would be considered as a high magnitude of change from the baseline, all soils within the developments are mapped/expected to be Grade 3b (which is non-BMV land) and heavy textured. This suggests that the soil resilience and sensitivity is identified

to be medium, resulting in a large adverse significant effect from the six cumulative developments on soil.

4.3.68. The **Outline Soil Management Plan (SMP) [EN010158/APP/7.7]** has been produced to prevent damage to soil structure, as well as potential damage to field drains (and subsequent effects on drainage of agricultural land). As a result of this, despite the cumulative effect being significant due to the magnitude of effect, there will not be a cumulative effect on BMV land, with the overall effect on soil and agricultural being mitigated through the use of a soil management plan.

4.3.69. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments on land and ground (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]** paragraphs 17.7.27 to 17.7.30), there are six developments within 1km of the Order Limits considered to contribute to impacts including the potential for temporary construction related accidental spills, run-off from construction activities, geological units being physically affected by excavations and mobilisation of existing contamination.

4.3.70. No interaction of impacts on receptors associated with land would be expected between the Proposed Development and ongoing/approved developments within the short list, as all potential impacts relating to land would be limited in lateral extent. As result, inter-project cumulative effects would **not be significant**.

4.3.71. Despite there being potential for adverse effects on ground water from more than one project to have a combined effect on ground water receptors, all six developments will be subject to respective mitigation plans agreed with relevant authorities. As a result, there would be **no inter-project cumulative effect**, suggesting that the **chances of significant inter-project cumulative effects** occurring on groundwater would be **low**.

4.4. Cumulative/Inter-Project Effects – Summary for Health Pathways

4.4.1. As summarised above from **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2]**, the Proposed Development and cumulative schemes considered are not considered to result in additive effects that would combine to increase the level of effect on individual receptors to a significant scale across most relevant determinants of health (including noise, air quality, land and water contamination, transport and access and socio-economics).

4.4.2. In each case, an appropriate ZoI has been established based on guidance and/or the likelihood of interaction of cumulative effects from different

projects that captures the spatial scale of impacts, which in most cases is limited.

4.4.3. Furthermore, where practicable the Applicant has committed to management plans and embedded mitigation that represents best practice and, in most cases, inherently considers thresholds that are determined by the potential for effects on health and wellbeing.

5. Commentary on Mental Health and Wellbeing

5.1. Considering Mental Health and Wellbeing

5.1.1. Mental health and wellbeing is inextricably linked to physical health outcomes. The WHO, for example, states that 'there is no health without mental health' (WHO, 2022) [**Ref. 45**]. Mental health problems 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, so too can they impact on mental wellbeing. Mental health and wellbeing have been overtly and inherently referred to at a number of points within this Health and Wellbeing Summary, and are intrinsically linked with other topic areas.

5.1.2. The mental health of every individual is influenced by their social setting, such as having the ability to earn enough money and feeling part of a community (Faculty of Public Health, 2016) [**Ref. 46**]. Community resilience can reduce the prevalence of mental health problems, increase the prevalence of good mental health and improve recovery and support for individuals (PHE, 2019) [**Ref. 47**].

5.1.3. The IEMA "Guide to Effective Scoping of Human Health" makes specific reference to good practice in considering mental health and wellbeing in developing EIA (which is defined as the "*state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community*"), noting that engagement can help to improve community understanding of the project and practitioner understanding of the community. Engagement can also actively alleviate particular impacts upon mental health, by providing a sense of control, inclusion and participation. Such engagement activities could be considered primary mitigation[6].

5.1.4. Through submissions via the **Scoping Opinion** and subsequent responses received to statutory and non-statutory consultation and through engagement, some organisations and members of the public have raised concerns around mental health and wellbeing including predominantly:

- The need for clear, transparent and meaningful engagement and consultation to demonstrate community feedback in considering the scheme design and the approach to mitigation measures;

[6] The IEMA Guidance draws on evidence from (Cooke et al, 2011) [**Ref. 3**], which had previously defined a toolkit to assess and improve projects from the perspective of mental health and wellbeing identified four areas for consideration: enhancing control, increasing resilience, facilitating participation and promoting social inclusion.

- Environmental change – e.g. perceptions of visual/open countryside being industrialised – mental health can relate to the control people feel they have over their physical environment, for example in relation to topics such as noise[7] pollution or air quality;
- Footpaths, accessibility and active recreation – including PRoW diversions and the impacts these diversions will have on the community's freedom to walk in the local countryside; and noise and amenity value of PRoW. In the IEMA Guidance "Determining Significance For Human Health In Environmental Impact Assessment" it is noted that there is a strong evidence base in the scientific literature for a causal relationship between physical activity and good physical and mental health;
- The potential for mental health effects relating to the loss of employment or socio-economic effects in the agricultural (and supporting) sectors;
- The potential for residential amenity to be affected, reducing house prices and financial stability, or reducing the ability to move house;
- The need for a review of the health implications related to electromagnetic radiation, concern about which has the potential to raise stress and anxiety.

5.1.5. In order to address the above points raised, the Applicant has in this **Health and Wellbeing Summary Statement**:

- Summarised the approach to assessment and mitigation of environmental effects with health pathways including noise, air quality, community access and landscape and visual effects and socio-economic change (see **Section 3**);
- Set out (below) a summary of the approach to consultation and engagement;
- Provided a clear description of the approach to BESS safety, major accidents and disasters, and health implications relating to EMF and radiation in order to provide comfort and reduce anxiety;
- Set out the approach to assessment of in-combination/intra-project effects on users of PRoW (see **Section 4**); and
- Set out the measures that specifically provide enhancements to mental health and wellbeing – including the provision of new PRoW (see **Section 3** and **Section 5**).

[7] IEMA "Guide to Effective Scoping of Human Health" makes specific reference to noise in terms of mental health, through its effect on sleep disturbance and quality of life.

5.2. Mental Health and Information, Communication, Engagement and Consultation

5.2.1. IEMA Guidance "Determining Significance For Human Health In Environmental Impact Assessment" [**Ref. 2**] highlights that people's perceptions of the project can greatly impact their psychological and physiological responses to changes. These perceptions may shift over time and are influenced by trust in the developer and regulators. Strong and persistent concerns can heighten sensitivity, particularly regarding mental health.

5.2.2. Stress and anxiety within a local population can be caused by a lack of awareness or information about a project and planned construction activities; people can feel they do not have a voice or lack control over how to raise issues and concerns they may have.

5.2.3. Consequently, it is important to consider if there are individuals with strong opinions or significant uncertainty about the project who may feel at risk to their health and well-being, and thus be affected by both actual changes and the potential for change.

5.2.4. As such, in the context of mental health and wellbeing, it is important to confirm the extent to which stakeholders and communities have been included in – and will continue to be important part of – engagement, project development and design evolution.

5.2.5. Pre-application consultation and engagement with the local community have been key features of the design of the Proposed Development as summarised in the **Consultation Report [EN010158/APP/5.1]**. This has included two phases of formal consultation and a targeted consultation on changes to the proposed layout of the BESS and location of Rosefield Substation and Main Collector Compound, alongside a continuous programme of stakeholder and community engagement

5.2.6. The **Consultation Report [EN010158/APP/5.1]** sets out how the pre-application consultation was undertaken in the development of the Proposed Development and highlights the main stages of consultation which are as follows:

Phase 1: Early plans and proposals (September 2023 to November 2023)

- This was a non-statutory consultation on early plans and proposals for the Proposed Development that took place over a 6-week period from 28 September 2023 to 10 November 2023.
- The purpose of this period of non-statutory consultation was to gain feedback on the early design of the Proposed Development, the EIA process and the Applicant's initial approach to community benefits.

- Consultees included people from the inner zone (people living, working or studying close to the Proposed Development and therefore likely to have a direct interest in proposals as shown in Figure 2-1 of the Consultation Report), people from the outer zone (people living, working or studying within the administrative boundaries of the host authority), host and neighbouring local authorities, statutory bodies (inc. Environment Agency, Historic England and Natural England) and other community groups with a material in the proposals).
- The applicant used a range of techniques to within the Phase 1 consultation period which included launch leaflets, writing to stakeholders and elected representatives, in-person and virtual exhibitions, deposit points where consultation material was readily available and stakeholder / community meetings.
- Approaches during this phase included 5,774 newsletters being delivered to homes and businesses, five public events within locations surrounding the Proposed Development, the provision of a range of communication channels enabling people to share feedback and detailed advertising.

Phase 2: Early plans and proposals (September 2023 to November 2023)

- This phase was a statutory consultation on updated plans and proposals for the Proposed Development, carried out in accordance with Planning Act 2008, APFP Regulations and EIA Regulations between 18 September 2024 and 5 December 2024.
- This phase of consultation was open to anyone with an interest in the Proposed Development.
- The Applicant also consulted a wide range of non-prescribed consultees due to their representative function, local knowledge and potential interest in the Proposed Development, which included parish councils, community and seldom heard groups, education providers, business representative groups and local interest organisations (including ecology, heritage and walking groups).
- Consultation materials were made readily available at two deposit locations (East and Botolph Claydon Village Hall and Winslow Community Library).
- Approaches during this phase included issuing 2,993 letters to homes and businesses around the Proposed Development, written engagement with stakeholders and community organisations to raise awareness of the consultation, five in person events in locations surrounding the Site boundary, a virtual exhibition available through the Rosefield Solar Farm project website and the provision of various communication channels to enable people to share feedback.

5.2.7. There was also a period of targeted consultation between 21 May and 16 July 2025 for two sets of changes to the scheme which are as follows:

- The incorporation of an existing farm track (currently used by traffic associated with HS2) to provide access to the area proposed for landscaping and environmental enhancements in Parcel 1a; and
- Changes to the locations of the BESS, the Main Collector Compound and Rosefield Substation.

5.2.8. The **Equality Impact Assessment [EN010158/APP/7.12]** also makes reference to the consultation process, stating that the Applicant was committed to ensuring that everyone had the opportunity to understand the Proposed Development through open and transparent engagement, clearly presented and easily digestible material, the provision of sufficient opportunities for interested parties and delivering consultation that meets legal requirements.

5.2.9. Inclusivity was key within the consultation process, with a particular focus on under-represented people such as people without internet access, seasonal workers, younger people and socially isolated people. This was achieved by:

- writing to local authorities and organisations that represent individuals/groups that may be difficult to get in contact with;
- choosing accessible venues (by wheelchair and with accessible parking facilities), publishing material online and newspapers;
- varying the time at which public events are held to cater to different time commitments;
- providing materials in alternative formats on request;
- contacting community and voluntary organisations; and
- providing a variety of communication channels.

Engagement Influencing Design

5.2.10. The **Design Approach Document [EN010158/APP/5.8]** (Section 5) sets out how the Proposed Development has evolved iteratively in response to consultation and engagement feedback from the community and local stakeholders, in accordance with critical 'Strategic Principles' of the project. This demonstrates tangible influence over the design of the Proposed Development by the community.

5.2.11. At each phase of consultation, the Applicant ensured that a range of engagement techniques were used, that materials were available in different formats and at appropriate levels and that the consultation was widely publicised. The Applicant has had regard to all responses received to consultation in finalising its proposals, with feedback from all phases of

consultation resulting in changes to the design of the Proposed Development. These changes, along with details of the ways in which the Applicant has complied with legislation, guidance and advice notes on pre-application consultation are explained in the **Consultation Report [EN010158/APP/5.1]**.

On-going Engagement and Consultation

5.2.12. Should the Application be granted consent, a Community Liaison Group (CLG) would be established prior to construction on the main site commencing, and last through the construction phase of the Proposed Development. This would provide a forum for discussion throughout the construction period, supplemented by a dedicated Community Liaison Officer to act as a point of contact should there be any queries outside of the forum. This is secured in Requirement 7 of the **Draft DCO [EN010158/APP/3.1]**.

5.2.13. In addition, the **Outline LEMP [EN010158/APP/7.6]** requires the Applicant to consult with the CLG on relevant points of interest during the detailed design stage. This could include, for example, the location and content of interpretation boards and waymarking signage and options for planting alongside footpaths (height, species and density).

5.2.14. While the CLG would not be in place during operation, updates would be given to the local community and stakeholders at key milestones to maintain an on-going relationship over the entire lifetime of the project. There would also be contact details onsite and online for members of the community and stakeholders to contact the asset operations team.

5.3. Access to the Natural Environment, Social Mobility and Recreation

5.3.1. As noted above, there is a strong evidence base in the scientific literature for a causal relationship between physical activity and good physical and mental health.

5.3.2. Guidance referred to earlier in this Statement also notes the positive mental health benefits related to the following health determinants and pathways (see **Table 1**):

- Physical activity;
- Access to open space, nature leisure and play;
- Transport modes, accessibility, active travel and connections;
- Community identity, culture, resilience and influence; and
- Social participation, cohesion, interaction and support.

5.3.3. The **Outline LEMP** [**EN010158/APP/7.6**] and **Outline RoWAS** [**EN010158/APP/7.8**] secures important enhancement measures relevant

to positive health pathways, including the provision of new permissive footpaths and increased accessibility, opportunities for recreation in the natural environment, and environmental improvements.

5.3.4. The Applicant will provide a variety of biodiversity benefits including: new habitat for invertebrates, reptiles, amphibians, small mammals and birds; the sowing of grassland open fields; scrub and margins with wildflower; the planting of hedgerows and tree belts; the establishment of ecological ponds (either former ponds for recreation or new ponds as blue infrastructure works) and wider vegetated cover for foraging and dispersal, to maintain bat flight lines across the landscape, and provide a winter seed source for birds. Further detail of these benefits are captured and secured within the **Outline LEMP [EN010158/APP/7.6].** The Proposed Development would deliver a Biodiversity Net Gain (BNG) in excess of 10%, as secured within the **Outline LEMP [EN010158/APP/7.6]**.

5.3.5. As such, the Applicant has sought to secure enhancements to community connectivity, accessibility, the natural environment and recreation within the DCO Application.

5.4. Potential for Effects on Residential Property

5.4.1. A number of members of the public and other stakeholder groups have raised concern about the mental health concerns relating to the impact of the Proposed Development on house prices.

5.4.2. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Housing, including design and affordability; and
- Relocation.

5.4.3. National Planning Practice Guidance advises that in general, planning is concerned with land use in the public interest. As a result of this, the protection of purely private interests such as the impact of a development on the value of neighbouring property could not be considered as a material planning consideration and is not a matter for assessment under the 2017 EIA Regulations [**Ref. 44**].

5.4.4. An assessment of the effects of development on property value was therefore considered to not be required as part of the socio-economic assessment within the Environmental Impact Assessment for this scheme.

5.4.5. The Applicant can confirm, however, that the ES evidences how design principles to limit impacts on individual residential properties and the landscape character of surrounding villages have been achieved as part of the design of the Proposed Development – for example through the **Design Approach Document [EN010158/APP/5.8]** and **Outline LEMP [EN010158/APP/7.6].**

5.4.6. No residential property would experience a visual effect which was so overbearing that it would render the dwelling an unpleasant or unattractive place to live; and following the implementation of appropriate mitigation, no significant adverse environmental effects are expected on residential property from the Proposed Development on: air quality, cultural heritage, noise and vibration, or traffic and transport.

5.4.7. Visual amenity aside, Part 1 of The Land Compensation Act 1973 (LCA) **[Ref. 48]** makes statutory provision for payment of compensation to qualifying property owners of properties that are depreciated in value as a result of the physical effects (including noise, smoke and fumes, but not including loss of value due to a diminished view or visual impact) of the use of development works such as this.

5.4.8. Notwithstanding this, the Applicant acknowledges representations from the local community about the potential effect of the Proposed Development on individual property values. The Applicant has designed the Proposed Development to limit impacts on properties in accordance with Project Principles set out in the **Design Approach Document [EN010158/APP/5.8]**. This includes the provision of appropriate offsets to local settlements and dwellings on a case-by-case basis and maintaining the rural separation between local villages.

5.5. Other Community Benefits

5.5.1. Whilst not a consideration for the Secretary of State, the Applicant is proposing a Community Benefit Fund reflecting £400 per MW of installed capacity per year from the start of operation and lasting throughout the operational lifetime of the Proposed Development. It is envisaged that it would be managed by an independent third party and delivered in partnership with the local community. Local people would be able to advise on the fund strategy and spend, to prioritise issues that are important to the local area.

5.6. Conclusions regarding Mental Health and Wellbeing

5.6.1. The overarching view based on the above – and in the context of concerns about the assessment of effects on mental health and wellbeing – is that:

- Engagement has been undertaken via the pre-application statutory, non-statutory consultation and bilateral and community engagement processes set out within the Appendices to the Consultation Report that have provided adequate provision of information and consideration of community and stakeholder feedback in the approach to design and assessment development;
- Key environmental assessments relating to the potential for effects on mental health have been undertaken (for example relating to noise and

air quality), and effects mitigated to their fullest extent such that residual effects are not significant where practically possible;

- Enhancements have been provided to the long-term accessibility of the area in order to promote and enhance physical and mental wellbeing.

5.6.2. While mental health and wellbeing is individual, subjective and experienced through a range of external factors beyond the Applicant's control, the Applicant considers that the approach taken to provide information and engage and consult, clearly and transparently assess and mitigate significant environmental effects (where practicable) and secure enhancement measures demonstrates that appropriate measures have been taken to address potential effects on mental health and wellbeing.

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Annex A

Health Effects Report

Rosefield Solar Farm

Health Effects Report (Tracked)

EN010158/APP/6.4.~~4~~3
Revision 3~~2~~
Deadline 3~~2~~
~~April~~ May 2026
Rosefield Energyfarm Limited

APFP Regulation 5(2)(a)

Planning Act 2008

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

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1. Context and Background

1.1. Introduction

~~1.1.1.~~ This document has been updated at Deadline 3~~2~~ in ~~response to the Written Representations received from Claydons Solar Action Group **[REP1-128]**, which has been helpful in providing additional context for the portion of the population assessed that is registered with a GP at the 3W Health practice. The **Health Effects Report** (**Annex A**) has been updated accordingly and submitted at Deadline 2 to account for this information and provide a more explicit conclusion in respect of the sensitivity of relevant sub-populations (older people, and people facing access or geographic factors) to change.~~

1.1.1. to provide an update in response to comments raised by Claydons Solar Action Group relating to effects on residential visual amenity.

~~1.1.2. .~~

~~1.1.3.~~1.1.2. The document references have not been updated from the original submission. Please refer to the **Guide to the Application [EN010158/APP/1.2.8~~7~~]** for the list of current versions of documents.

~~1.1.4.~~1.1.3. This Health Effects Report has been prepared on behalf of Rosefield Energyfarm Limited ('the Applicant') and sets out the approach to the consideration and assessment of effects of Rosefield Solar Farm (hereafter referred to as the 'Proposed Development') on human health and wellbeing (both physical and mental health) during the construction, operational (including maintenance) and decommissioning phases of development.

~~1.1.5.~~1.1.4. During the pre-application phase, in line with the proposed approach set out through **ES Volume 4, Appendix 5.1: EIA Scoping Report [APP-079]**, and cognisant of **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [APP-080]**, and in consideration of comments received from Buckinghamshire Council, the UK Health Security Agency (UKHSA) and other stakeholders including members of the community in the pre-application stage (through the scoping opinion, responses to statutory consultation, and engagement), the Applicant provided **ES Volume 4, Appendix 5.5: Health and Wellbeing Summary Statement [EN010158/APP/6.4.2]** within the ES in order to:

- Summarise, in a single document, how health and wellbeing has been considered in the development of the Proposed Development including through design, impact assessment, and the approach to consultation and engagement;

- Set out where individual topic assessments have considered health and wellbeing effects, and report them in terms of significance, applying a health 'lens'; and
- Demonstrate regard to and consideration of guidance on the assessment of effects on health and wellbeing.

~~1.1.6.~~1.1.5. Subsequently, the Examining Authority noted in its Request for Further Information under Section 89(3) dated 9 January 2026 **[PD-006]** that:

- "Whilst the individual ES chapters consider the effects on human health, they do not reach conclusions on the likely significance of effects"; and
- "*Whilst the Health and Wellbeing Summary Statement [APP-083] draws conclusions on the significance of effects on human health, it does not set out clearly how these conclusions were derived*".

~~1.1.7.~~1.1.6. The Examining Authority therefore requested that "*the assessment of, and conclusions on likely effects on human health should be contained in one document, either in the individual ES chapters, or in a separate report*".

~~1.1.8.~~1.1.7. The Applicant has subsequently engaged with Buckinghamshire Council and has agreed to produce this Health Effects Report for submission at Deadline 1 in order to address this, and respond to Buckinghamshire Council's concerns raised via their Relevant Representation.

~~1.1.9.~~1.1.8. Fundamentally, this Report is intended to provide a clear assessment of the health and wellbeing effects of the Proposed Development, in-line with standard industry guidance and in accordance with the requirements of legislation and national policy.

~~1.1.10.~~1.1.9. This has the benefit of providing a clear application of standard health guidance as an additional layer to the topic-specific methodology, in terms of the significance of health effects – which includes consideration of:

- The ability to deliver current health policy and/or the ability to narrow health inequalities, as evidenced by referencing relevant policy and effect size and in the context of community feedback on the importance of effects;
- Effects in the context of regulatory thresholds or statutory standards;
- Potential changes in the health baseline of the population; and
- Health priorities for the relevant study area.

~~1.1.11.~~1.1.10. This Health Effects Report sets out:

- At **Section 2** – A summary of the relevant legislation, policy context and guidance used in the assessment of effects on health and wellbeing related to the Proposed Development;
- At **Section 3** – A summary of the consultation and engagement undertaken in the pre-application period and commitments to the incorporation of iterative design changes, and on-going engagement in the context of supporting mental health and wellbeing;
- At **Section 4** – The scope and approach to the assessment, including information drawn from assessments across **APP-043**, **APP-045**, **APP-046** and **APP-047**, a description of the overall definition and application of health determinants and pathways, an overview of health-specific sensitivity and magnitude indicators, and significance criteria used for the assessment;
- At **Section 5** – A detailed health and wellbeing baseline / context, setting out the prevailing demographic and socio-economic conditions including existing health inequalities, and details of the characteristics of receptors, receptor groups and sub-populations;
- At **Section 6** – A review of health-related mitigation embedded into the design of the Proposed Development, related to identified determinants and pathways of health and wellbeing;
- At **Section 7** – A description of the likely significant effects on health, as determined by the scope for identifying those wider determinants of health relevant to the Proposed Development, drawing on reported impact assessment across **APP-043**, **APP-045**, **APP-046** and **APP-047**, including a review of the additional mitigation related to avoiding, reducing or managing health effects that may otherwise contribute to adverse impacts on mental health and wellbeing as a result of the Proposed Development; and an assessment of the residual effects on health, by wider determinant of health, as a result of the Proposed Development. This takes into account the sensitivity of the receptors, embedded and additional mitigation and the magnitude of change as a result, applying health-specific criteria.

1.2. Supporting and Reference Documents

1.2.1. The following documents within the DCO Application are drawn upon within this Health Effects Report:

ES Assessments:

- **ES Volume 1, Chapter 5: Approach to the EIA [EN010158/APP/6.1] [APP-048]**;
- **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]**;

- **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]**;
- **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]**;
- **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]**;
- **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057];**
- **ES Volume 2, Chapter 15: Transport and Access [EN010158/APP/6.2] [APP-058]**;
- **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]**;
- **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**;
- **ES Volume 4, Appendix 5.4: Glint and Glare Assessment [EN010158/APP/6.4] [APP-082]**;
- **ES Volume 4, Appendix 5.5: Health and Wellbeing Summary Statement [EN010158/APP/6.4.2]**; and
- **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4.2] [PDA-004]**;

Non-ES and Supporting ES Assessments:

- **Outline Drainage Strategy [EN010158/APP/7.11.2]**;
- **Equality Impact Assessment [EN010158/APP/7.12] [APP-148]**; and
- **BESS Plume Assessment Summary [EN010158/APP/7.13.2]**.

Management Plans, Mitigation and Control Documents:

1.2.2. These documents, set out below, have been directly influenced by the assessment of likely significant effects, and through the application of good design and practice to avoid, reduce or monitor and manage environmental effects with an inherent and specific consideration of the health implications on populations and sub-populations of those environmental effects.

1.2.3. These plans and strategies include the design and implementation of tangible measures to physically mitigate effects.

1.2.4. Importantly, they also include the provision of information to affected communities and users of the accessible natural environment, and opportunities for engagement and feedback to ensure that people are able to gain information and review the approach to be taken by the Applicant,

which is considered an important factor to reducing the potential for adverse mental health and wellbeing effects.

- **Design Commitments [EN010158/APP/5.9.3]**;
- **Outline Construction Environmental Management Plan (CEMP) [EN010158/APP/7.2.2]**. Within the **Outline CEMP [EN010158/APP/7.2.2]**, mitigation measures in respect of various topics within **ES Volume 2** of relevance to human health can be found at the following:

- **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** – Table 3.1;
- **ES Volume 2, Chapter 8: Climate [EN010158/APP/6.2] [APP-051]** – Table 3.3;
- **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** – Table 3.5;
- **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]** – Table 3.6;
- **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** – Table 3.8;
- **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]** – Table 3.9; and
- **ES Volume 2, Chapter 12: Soil [EN010158/APP/6.2] [APP-055]** – Table 3.7.

- Outline Construction Traffic Management Plan [EN010158/APP/7.5.2];
- Outline Landscape and Ecological Management Plan [EN010158/APP/7.6.2];
- **Outline Operational Environmental Management Plan (OEMP) [EN010158/APP/7.3.2]**. Mitigation measures in respect of various topics within **ES Volume 2** of relevance to human health can be found at the following:

- **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** – Table 3.1;
- **ES Volume 2, Chapter 7: Biodiversity [EN010158/APP/6.2.2]** – Table 3.2;
- **ES Volume 2, Chapter 8: Climate [EN010158/APP/6.2] [APP-051]** – Table 3.3;
- **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]**– Table 3.5;
- **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** – Table 3.7;
- **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]** – Table 3.8; and

- **ES Volume 2, Chapter 12: Soil [EN010158/APP/6.2] [APP-055]** – Table 3.7–Table 3.6
  - Outline Soil Management Plan [EN010158/APP/7.7.2];
  - Outline Rights of Way and Access Strategy [EN010158/APP/7.8.2];
  - **Outline Decommissioning Environmental Management Plan (DEMP) [EN010158/APP/7.4.2]**. Mitigation measures in respect of various topics within **ES Volume 2** of relevance to human health can be found at the following:
    - **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** – Table 3.1;
    - **ES Volume 2, Chapter 7: Biodiversity [EN010158/APP/6.2.2]** – Table 3.2;
    - **ES Volume 2, Chapter 8: Climate [EN010158/APP/6.2] [APP-051]** – Table 3.3;
    - **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** – Table 3.5;
    - **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]** – Table 3.6;
    - **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** – Table 3.8;
    - **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]** – Table 3.9; and
    - **ES Volume 2, Chapter 12: Soil [EN010158/APP/6.2] [APP-055]** – Table 3.7.
  - **Outline Battery Safety Management Plan [EN010158/APP/7.9.2];** and
  - **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14.2]**.

Other Documents:

- **Consultation Report [EN010158/APP/5.1] [APP-020]**; and
- **Design Approach Document [EN010158/APP/5.8.2]**.

2. Legislative Framework, Policy and Guidance

2.1. Legislation

2.1.1. The Infrastructure Planning (EIA) Regulations 2017 (UK Government, 2017) [**Ref. 1**] require the EIA for nationally significant infrastructure projects to consider potential impacts on health and wellbeing.

2.1.2. The following legislation is also of relevance to this Report:

- Health and Safety at Work etc. Act 1974 (UK Government, 1974) **[Ref. 2]**;
- Environmental Protection Act 1990 (UK Government, 2005) **[Ref. 3]**;
- Clean Air Act 1993 (UK Government, 1993) **[Ref. 4]**;
- Environment Act 1995 (UK Government, 1995) **[Ref. 5]**;
- Countryside and Rights of Way Act 2000 (UK Government, 2000) **[Ref. 6];**
- Health Protection (Notification) Regulations 2010 (UK Government, 2010) **[Ref. 7]**;
- The Control of Electromagnetic Fields at Work Regulations 2016 (UK Government, 2016) **[Ref. 8]**; and
- The Equality Act 2010 (UK Government, 2010) **[Ref. 9]**.

2.2. National Policy

Overarching National Policy Statement for Energy (NPS EN-1)

2.2.1. Part 4.4 of the Overarching National Policy Statement for Energy (EN-1) (NPS EN-1) (Department for Energy Security and Net Zero (DESNZ), 2024) [**Ref. 10**] refers to health and wellbeing impacts of energy infrastructure projects such as the Proposed Development. Specifically:

- Paragraph 4.3.4 states: “To consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, biodiversity net gain, community cohesion, health and well-being”.
- Paragraph 4.4.1 advises 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".

- Paragraph 4.4.2 advises that "The direct impacts on health may include: increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation, and increases in pests".
- Paragraph 4.4.3 states: "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".
- Paragraph 4.4.4 states: "As described in the relevant sections of this NPS and in the technology specific NPSs, 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".
- Paragraph 4.4.5 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".
- Paragraph 4.4.6 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".
- Paragraph 4.4.7 advises that the aspects of energy infrastructure which are "most likely to have a significantly detrimental impact on health are subject to separate regulation (for example air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either by themselves constitute a reason to refuse consent or require specific mitigation".
- Paragraph 4.12.2, paragraph 5.12.6, paragraph 5.15.1, and paragraph 5.16.2 are relevant to the technical chapters on which this report draws upon.

National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)

2.2.2. This National Policy Statement (NPS EN-3) (2024) [**Ref. 11**] sets various requirements that a development is expected to meet in order to progress through the planning process and gain consent from the Planning Inspectorate. These include several aspects that are relevant to determinants and pathways for health effects including public rights of way (PRoW) and access, design and visual amenity and agriculture.

National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)

2.2.3. This National Policy Statement (NPS EN-5) (2024) [**Ref. 12**] was drafted to support the transition to clean power by 2030 and to ensure the security and reliability of the UK's electricity supply.

2.2.4. When looking at components of the policy statement of relevance to health, the policy highlights the direct and indirect effects that electromagnetic fields (EMFs) can have on human health, aquatic and terrestrial organisms. In order to prevent these effects, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) created health protection guidelines to protect the public and occupational workers from exposure. All new electricity infrastructure is expected to comply with these guidelines.

National Planning Policy Framework (NPPF)

2.2.5. The National Planning Policy Framework (NPPF) [**Ref. 13**] sets out the government's planning policies for England. Chapter 8 'Promoting Healthy and Safe Communities' sets out a planning policy framework of direct relevance to human health, emphasising that planning and development should aim to 'achieve healthy, inclusive and safe places'.

2.3. Local Planning Policy & Community Strategy

Buckinghamshire Council Corporate Plan

2.3.1. The Buckinghamshire Council Corporate Plan [**Ref. 14**] highlights the council's overarching objectives around making Buckinghamshire the best place to live, raise a family, work and do business by increasing prosperity, strengthening communities, improving the environment and protecting the vulnerable.

2.3.2. In order to strengthen communities, Buckinghamshire Council are committed to improving health and wellbeing with a particular focus on reducing any gap in health outcomes. In addition, Buckinghamshire Council are also dedicated to ensuring that families feel safe and supported, and that disabled and vulnerable people receive the right support at the right time. When looking at improvements to the environment, the corporate plans also highlight Buckinghamshire Councils ambitions to address climate change by creating economic opportunities for clean growth and to improve air quality by reducing carbon emissions.

Buckinghamshire Draft Joint Local Health and Wellbeing Strategy

2.3.3. The Draft Buckinghamshire Joint Local Health and Wellbeing Strategy [**Ref. 15**] sets out the aims and strategic direction that Buckinghamshire Council have committed to take between 2025 and 2035 to ensure that

health and wellbeing within Buckinghamshire is improved, and that health inequalities are reduced. The main areas of focus highlighted within this strategy are based around reducing health inequalities, improving population health and ensuring the sustainability of services.

2.3.4. In order to realise Buckinghamshire Council's vision and deliver against the Council's ambitions, the following strategic priorities were developed:

- Working with people and communities to empower them to live active and fulfilling lives, with a focus on the wider determinants of health such as housing, employment and education;
- Having a greater emphasis on preventing illness and encouraging independence so that people can live healthier and more independent lives; and
- Working to identify and support people with needs to prevent escalation of their condition or decline of their overall health and wellbeing.

Vale of Aylesbury Local Plan

2.3.5. The Vale of Aylesbury Local Plan 2013 – 2033 [**Ref. 16**] can be defined as the cornerstone of planning for the whole plan area which is critical to delivering on national, community and corporate objectives.

2.3.6. The vision set out within the Local Plan suggests that Aylesbury Vale will see a sustainable amount and distribution of growth in order to meet the area's needs, contributing to the creation of a thriving, diverse, safe and vibrant place to live, work and visit. In order for this growth to occur, the economy will be more competitive and innovative, while growth will also be accompanied with the delivery of infrastructure, services and facilities to bring maximum benefits to new/existing communities.

2.3.7. Strategic objectives of direct relevance to human health include:

- Making provision for balanced sustainable growth which will deliver new housing and jobs to meet the needs of new and existing residents through a flexible and pro-active approach to promoting sustainable development;
- Working with partners to secure the timely and well-located provision of infrastructure, services and facilities to sustain and enhance existing and new communities (including education, training and community facilities, accessible green infrastructure and associated sport and recreational facilities, and social care and health infrastructure);
- Managing development in a way that ensures the protection and enhancement of Aylesbury Vale's built, natural and historic environment, landscape and biodiversity;

- Managing development in a way that ensures that climate change is mitigated against, including making appropriate provision for the generation and use of renewable or low-carbon energy; and
- Promoting the provision of measures that strengthen the quality of life for new and existing residents of Aylesbury Vale, while addressing pockets of health deprivation and health inequalities within the area.

2.3.8. Policies of particular relevance to human health are as follows:

- S1 'Sustainable development for Aylesbury Vale';
- T7 'Footpaths and cycle routes';
- BE3 'Protection of amenity of residents';
- NE1 'Biodiversity and Geodiversity';
- NE5 'Pollution, air quality and contaminated land';
- NE6 'Local green space';
- C3 'Renewable Energy';
- C4 'Protection of public rights of way'; and
- I3 'Community facilities, infrastructure and assets of community value'.

Buckinghamshire Rights of Way Improvement Plan (2020 to 2030)

2.3.9. The Buckinghamshire Rights of Way Improvement Plan [**Ref. 17**] sets out the Council's priorities for improving PRoWs for both residents and visitors. The plan also highlights the fact that PRoWs support better health and wellbeing by providing places for people to exercise. In addition to this, the plan also suggests that walking and cycling can assist in reducing harmful effects (e.g. air pollution from traffic) and improving the overall health of the local population.

2.3.10. The promotion and improvement of rights of way within Buckinghamshire can lead to improvements in areas of poorer health (e.g. areas with high child obesity), address health inequalities through improving access to the natural environment and create better places that support health and wellbeing.

Buckinghamshire Vision

2.3.11. The Buckinghamshire Vision [**Ref. 18**] sets out the measures that need to be taken in order to ensure that Buckinghamshire will grow as a *"thriving, resilient and successful county"*, where both *"residents and businesses can reach their best potential, growth is delivered sustainably to support meeting net zero and environmental enhancement is achieved to support a high quality of life for our communities"*.

2.3.12. Buckinghamshire Council is committed to having a clear and collaborative future vision in order to address the various challenges that the area is currently facing which include pressures on the natural environment, spatial concentrations of health inequalities, the challenges of an ageing population on public services and areas of deprivation with high levels of unemployment.

2.3.13. As a result of this, the Council is committed to protecting and enhancing the natural environment, ensuring that health inequalities are reduced and mental health is improved, and ensuring that Buckinghamshire is a safe, healthy and prosperous location.

2.3.14. The three main objectives of the plan are set out below, in addition to the components of these objectives that are of direct relevance to human health:

- **Successful businesses and careers** – ensuring that Buckinghamshire is resilient and adaptable, while ensuring that every business across the county has a chance to succeed and supporting and improving the physical and mental health of the workforce as a vital backbone to economic performance;
- **Thriving culture, heritage and natural environment** –tackling impacts of climate change to achieve net zero by 2050, increasing the use of sustainable resources and supporting the development of renewable energy generation, in addition to supporting active lifestyles and good physical and mental health by making it easier for local residents to access clean air, natural spaces and food growing areas; and
- **Vibrant and connected places** – creating a 'Buckinghamshire' where residents are able to live independent, healthy and connected lives in vibrant, low-carbon places, by tackling social exclusion, health inequalities and areas of deprivation to enhance digital/physical connectivity, promoting walking and cycling as the first choice for local journeys, and improving opportunities for sport and leisure to support mental health and encourage healthy behaviours.

The Local Plan for Buckinghamshire – Draft Vision and Objectives

2.3.15. The Draft Vision and Objectives Local Plan document published by Buckinghamshire Council [**Ref. 19**] sets out what Buckinghamshire Council want the local plan to achieve, covering climate change, the natural environment, housing, infrastructure and how Buckinghamshire connects to other places.

2.3.16. The overarching vision for Buckinghamshire in 2040 references aims of ensuring that Buckinghamshire is *"mitigating and adapting to"* climate change, increasing the provision of active and sustainable opportunities

and encouraging the delivery of new renewable energy schemes to reduce harmful emissions.

2.3.17. Objectives of direct relevance to human health set out within this document are as follows:

- **Natural and built environment** – conserving/enhancing Buckinghamshire's value natural, historic and built environment by conserving/enhancing special places for nature and creating a county-wide network of green and blue infrastructure;
- **Mitigating/adapting to climate change** – ensuring the delivery of sustainable development and mitigating against climate change by increasing the supply of renewable/low-carbon energy and providing attractive and viable alternative to the private car;
- **Quality of place** – creating great places to live and work that are safe and accessible to all which will include securing a robust network of spaces across Buckinghamshire that for recreation, play, biodiversity and water infrastructure, connecting to the rights of way network;
- **Community health and wellbeing** – improving health care facilities and access to these facilities, while supporting physical/mental health and social/cultural wellbeing by supporting active lifestyles and good health through people-friendly streets and open spaces, ensuring that local health facilities are accessible and of a good standard, providing new/enhanced sports, leisure and cultural facilities and improving Air Quality Management Areas (AQMAs);
- **Infrastructure** – ensuring that the right infrastructure is provided at the right time which will include providing appropriate social infrastructure for health, education, skills training, sports and recreation, connecting blue and green infrastructure to enhance biodiversity and the creation of safe and vibrant public spaces; and
- **Transport, physical and digital connectivity** – improving connectivity between Buckinghamshire's towns and villages through the creation of safe and attractive walking and cycling routes and delivering low or zero carbon fuel infrastructure through new development.

Buckinghamshire Healthy Ageing Strategy

2.3.18. The Buckinghamshire Healthy Ageing Strategy [**Ref. 20**] highlights the Council's commitments to becoming more 'age-friendly', with the three central outcome measures for this strategy being ensuring that people over the age of 65 spend more of their lives in good health, getting more people over the age of 65 into work and ensuring that fewer adults feel lonely and isolated.

2.3.19. Aims across the age friendly Buckinghamshire themes that are of direct relevance to human health are as follows:

- Creating high quality, accessible, social and safe public spaces;
- Promoting accessible, affordable and appropriate travel options;
- Reducing and removing barriers to participation to foster engagement with activities/events to create a sense of belonging;
- Strengthening the health and wellbeing of communities, while supporting the network of community-based groups; and
- Supporting people from all backgrounds to age well with respect and dignity.

Sustainable Community Strategy for Buckinghamshire

2.3.20. The Buckinghamshire Sustainable Community Strategy [**Ref. 21**] sets out the shared partnership vision for Buckinghamshire up until 2026, with the Bucks Strategic Partnership having aims of transforming Buckinghamshire into a *"economically prosperous"* area where all communities can enjoy a high quality of life and an enhanced local environment.

2.3.21. The strategy sets out various broad themes/outcomes, with the outcomes of relevance to human health summarised below:

- Sustainable Environment – tackling climate change, enhancing and protecting the local environment, reducing waste and managing the transport network;
- Safe Communities – reducing crime and the fear of crime, reducing the harm caused by alcohol and drugs, improving the safety of local people and promoting safe development;
- Health and Wellbeing – promoting healthy lifestyles, reducing health inequalities, improving quality of life for the children and young people as well as the ageing population and creating well-connected communities; and
- Cohesive and Strong Communities – increasing the confidence of communities and reducing levels of disadvantage.

2.4. Local Health Priorities

Buckinghamshire Joint Strategic Needs Assessment (JSNA) and Buckinghamshire Joint Health and Wellbeing Strategy

2.4.1. The JSNA [**Ref. 22**] provides a snapshot of the current and future health care needs of the local population in the County of Buckinghamshire.

2.4.2. Buckinghamshire's Joint Health and Wellbeing Strategy [**Ref. 23**] enables the Health and Wellbeing Board to champion the shared ambitions and aims while setting out the various actions that need to be taken in order to improve health and wellbeing for Buckinghamshire residents and reduce health inequalities.

2.4.3. Key priority areas that were identified as part of the health and wellbeing strategy include:

- Starting well – improving outcomes during maternity and early years, improving mental health support for children and young people and reducing the prevalence of obesity;
- Living well – reducing rates of cardiovascular disease, improving mental health support for adults and reducing obesity in adults; and
- Ageing well – improving places and helping communities support healthy ageing, improving mental health support and reducing feelings of social isolation for older people, and increasing physical activity amongst older people.

2.5. Neighbourhood Plans

Steeple Claydon Neighbourhood Plan (Referendum Plan 2013–2033) September 2017

2.5.1. Steeple Claydon Neighbourhood Plan **[Ref. 24]** includes specific community objectives of relevance to human health as follows:

- To encourage development which addresses local housing and community infrastructure needs; and
- To protect and enhance community assets (facilities, buildings and green spaces).

2.5.2. Policy SC1 'Steeple Claydon Settlement Boundary' suggests that development proposals on land outside the settlement boundary will not be permitted unless they support sustainable growth and expansion of business or enterprise within the countryside or support sustainable rural tourism or leisure development that benefits businesses, communities and visitors of the countryside area.

Quainton Neighbourhood Plan (2015 – 2033) Modified Version – June 2022

2.5.3. Quainton Neighbourhood Plan [**Ref. 25**] sets an overarching vision based around creating a *"thriving community-based village with a treasured rich heritage where people can fulfil their ambitions for home, work and leisure in a safe, friendly and rural environment"*.

2.5.4. The Neighbourhood Plan includes specific community objectives of relevance to human health as follows:

- Balancing growth with the need to protect the village environment;
- Protecting the rural landscape, particularly green spaces, footpaths, bridle paths, recreation areas and important viewpoints; and
- Promoting biodiversity and protecting flora and fauna.

Winslow Neighbourhood Plan (2022-2033) Modified

2.5.5. Winslow Neighbourhood Plan [**Ref. 26**] sets an overarching vision of making Winslow *"a more sustainable town that is increasingly able to meet its own needs for housing, jobs, community facilities and public and commercial services"*.

2.5.6. An objective within the Neighbourhood Plan that is of direct relevance to human health is based around encouraging the greater use of walking, cycling and public transport.

2.5.7. Policy 11 'Traffic, Transport, Cycle Routes and Parking' suggest that cycle routes should be incorporated as integral design features within major new developments in order to create useful and effective links for cyclists and pedestrians.

Calvert Green Neighbourhood Plan (2024 – 2034) Pre-Submission Version

2.5.8. Calvert Green Neighbourhood Plan [**Ref. 27**] sets an overarching vision which is based around making sure that Calvert Green remains a *"safe, healthy, clean and caring place that people want to live in for the long term".*

2.6. Guidance

2.6.1. Relevant guidance, policy statements and codes of practice that have informed the approach to, and which have been considered as part of, the consideration of health and wellbeing effects comprise the following:

- Design Manual for Roads and Bridges (DMRB) Document LA112: Population and Human Health (Standards for Highways, 2020) [**Ref. 28**];

- Institute of Environmental Management and Assessment (IEMA) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment 2022 (IEMA[1], 2022) [**Ref. 29**];
- IEMA Guide to: Determining Significance for Human Health in EIA Guidance (IEMA, 2017) [**Ref. 30**];
- Institute of Sustainability and Environmental Professionals (ISEP) (2025) Social Impact Assessment in Environmental Impact Assessment in the UK and Ireland (ISEP, 2025) [**Ref. 31**];
- Public Health England (PHE) Spatial Planning for Health: An Evidence resource for designing healthier places (PHE, 2019) [**Ref. 32**];
- PHE Health and Environmental Impact Assessment: A Briefing for Public Health Teams in England (PHE, 2017) [**Ref. 33**];
- Institute of Public Health: Impact Assessment Guidance: A Manual. Standalone Health Impact Assessment and health in environmental assessment. Health Impact Assessment Guidance (Institute of Public Health, 2021) [**Ref. 34**];
- Nationally Significant Infrastructure Projects: Advice on Preparing Applications for Linear Projects (2025) - Health and Wellbeing of Local Communities (Planning Inspectorate, 2025) [**Ref. 35**];
- UK Health Security Agency Electric and magnetic fields: health effects of exposure (UK Health Security Agency, 2013) [**Ref. 36**];
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) (2020). Guidelines for limiting exposure to electromagnetic fields (100 kHz to 300 GHz) [**Ref. 37**];
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) (2020). National Radiological Protection Board Review of the scientific evidence for limiting exposure to electromagnetic fields (0-300 GHz) (ICNIRP, 2020) [**Ref. 38**];
- UK Stakeholder Advisory Group on Extremely Low Frequency Electric and Magnetic Fields (Department for Health and Social Care, 2011) [**Ref. 39**];
- Department of Energy and Climate Change Power Lines: Demonstrating compliance with EMF public exposure guidelines:

[1] The Institute of Environmental Management and Assessment (IEMA) was rebranded to the since rebranded as Institute of Sustainability and Environmental Professionals (ISEP). Accordingly, this report refers to 'IEMA' when discussing guidance published before the rebranding and 'ISEP' for guidance issued thereafter, to accurately reflect the organisation's name at the time each document was released.

voluntary code of practice (Department of Health and Social Care, 2012) [**Ref. 40**]; and

- Department for Environment, Food & Rural Affairs (DEFRA) Noise Policy Statement for England (DEFRA, 2010) [**Ref. 41**].

2.6.2. Collectively, the above documents guide the assessment of effects by providing advice and direction on appropriate methods, significance criteria, and the parameters relevant to health and wellbeing.

2.6.3. The following additional reports provide context for undertaking a health and wellbeing assessment:

- PHE Strategy 2020 to 2025 (PHE, 2019) [**Ref. 42**];
- The Marmot Review: Fair Society Healthy Lives (Institute of Health Equity, 2010) [**Ref. 43**];
- Health Equity in England: The Marmot Review 10 Years On (2020) (Institute of Health Equity, 2020) [**Ref. 44**];
- Build Back Fairer: The Covid-19 Marmot Review (2020) (Institute of Health Equity, 2020) [**Ref. 45**]; and
- NHS 10 Year Health Plan for England: Fit for the future (Department for Health and Social Care, 2025) [**Ref. 46**].

3. Consultation and Engagement

3.1.1. IEMA guidance "*Determining Significance For Human Health In Environmental Impact Assessment*" [**Ref. 30**]; highlights that people's perceptions of a project can greatly impact their psychological and physiological responses to changes. These perceptions may shift over time and are influenced by trust in the developer and regulators. Strong and persistent concerns can heighten sensitivity, particularly regarding mental health.

3.1.2. Stress and anxiety within a local population can be caused by a lack of awareness or information about a project and planned construction activities; people can feel they do not have a voice or lack control over how to raise issues and concerns they may have.

3.1.3. Consequently, it is important to consider if there are individuals with strong opinions or significant uncertainty about the project who may feel at risk to their health and well-being, and thus be affected by both actual changes and the potential for change.

3.1.4. As such, in the context of mental health and wellbeing, it is important to confirm the extent to which stakeholders and communities have been included in – and will continue to be an important part of – engagement, project development and design evolution.

3.1.5. Pre-application consultation and engagement with the local community have been key components in the preparation of the design of the Proposed Development as summarised in the **Consultation Report [EN010158/APP/5.1] [APP-020]**.

3.1.6. This has included two phases of formal consultation and a targeted consultation on changes to the proposed layout of the BESS and location of Rosefield Substation and Main Collector Compound, alongside a continuous programme of stakeholder and community engagement

3.1.7. The **Consultation Report [EN010158/APP/5.1] [APP-020]** sets out how the pre-application consultation was undertaken in the development of the Proposed Development and highlights the main stages of consultation which are as follows:

Phase 1: Early plans and proposals (September 2023 to November 2023)

- This was a non-statutory consultation on early plans and proposals for the Proposed Development that took place over a 6-week period from 28 September 2023 to 10 November 2023.

- The purpose of this period of non-statutory consultation was to gain feedback on the early design of the Proposed Development, the EIA process and the Applicant's initial approach to community benefits.
- Consultees included people from the inner zone (people living, working or studying close to the Proposed Development and therefore likely to have a direct interest in proposals as shown in **Figure 2-1** of the **Consultation Report [EN010158/APP/5.1]** [APP-020]), people from the outer zone (people living, working or studying within the administrative boundaries of the host authority), host and neighbouring local authorities, statutory bodies (inc. Environment Agency, Historic England and Natural England) and other community groups with a material in the proposals).
- The applicant used a range of techniques within the Phase 1 consultation period which included launch leaflets, writing to stakeholders and elected representatives, in-person and virtual exhibitions, deposit points where consultation material was readily available and stakeholder/community meetings.
- Approaches during this phase included 5,774 newsletters being delivered to homes and businesses, five public events within locations surrounding the Proposed Development, the provision of a range of communication channels enabling people to share feedback and detailed advertising.

Phase 2: Early plans and proposals (September 2023 to November 2023)

- This phase was a statutory consultation on updated plans and proposals for the Proposed Development, carried out in accordance with the Planning Act 2008, APFP Regulations and EIA Regulations between 18 September 2024 and 5 December 2024.
- This phase of consultation was open to anyone with an interest in the Proposed Development.
- The Applicant also consulted a wide range of non-prescribed consultees due to their representative function, local knowledge and potential interest in the Proposed Development, which included parish councils, community and seldom heard groups, education providers, business representative groups and local interest organisations (including ecology, heritage and walking groups).
- Consultation materials were made readily available at two deposit locations (East and Botolph Claydon Village Hall and Winslow Community Library).
- Approaches during this phase included issuing 2,993 letters to homes and businesses around the Proposed Development, written engagement with stakeholders and community organisations to raise awareness of the consultation, five in person events in locations

surrounding the Site boundary, a virtual exhibition available through the Rosefield Solar Farm project website and the provision of various communication channels to enable people to share feedback.

Targeted Consultation

3.1.8. There was also a period of targeted consultation between 21 May and 16 July 2025 for two sets of changes to the scheme which are as follows:

- The incorporation of an existing farm track (currently used by traffic associated with HS2) to provide access to the area proposed for landscaping and environmental enhancements in Parcel 1a; and
- Changes to the locations of the BESS, the Main Collector Compound and Rosefield Substation.

Consideration of Equality within Consultation

3.1.9. The **Equality Impact Assessment [EN010158/APP/7.12] [APP-148]** also makes reference to the consultation process, stating that the Applicant is committed to ensuring that everyone had the opportunity to understand the Proposed Development through open and transparent engagement, clearly presented and easily digestible material, the provision of sufficient opportunities for interested parties and delivering consultation that meets legal requirements.

3.1.10. Inclusivity was key within the consultation process, with a particular focus on under-represented people such as people without internet access, seasonal workers, younger people and socially isolated people. This was achieved by:

- Writing to local authorities and organisations that represent individuals/groups that may be difficult to get in contact with;
- Choosing accessible venues (by wheelchair and with accessible parking facilities), publishing material online and newspapers;
- Varying the time at which public events are held to cater to different time commitments;
- Providing materials in alternative formats on request;
- Contacting community and voluntary organisations; and
- Providing a variety of communication channels.

3.2. Engagement Influencing Design

3.2.1. Section 5 of the **Design Approach Document [EN010158/APP/5.8.2]** sets out how the Proposed Development has evolved iteratively in response to consultation and engagement feedback from the community

and local stakeholders, in accordance with the critical 'Strategic Principles' of the project. This demonstrates tangible influence over the design of the Proposed Development by the community.

3.2.2. At each phase of consultation, the Applicant ensured that a range of engagement techniques were used, that materials were available in different formats and at appropriate levels and that the consultation was widely publicised.

3.2.3. The Applicant has had regard to all responses received to consultation in finalising its proposals, with feedback from all phases of consultation resulting in changes to the design of the Proposed Development. These changes, along with details of the ways in which the Applicant has complied with legislation, guidance and advice notes on pre-application consultation are explained in the **Consultation Report [EN010158/APP/5.1] [APP-020]**.

3.3. Commitments to On-going Engagement

3.3.1. A key element relating to predictability of the environment is the commitment (secured within the **Outline CEMP [EN010158/APP/7.2.2]**) to the provision of information and community liaison which would ensure occupiers of neighbouring properties are informed in advance of the construction works. The community liaison officer would provide the community including particularly sensitive receptors with an appropriate person who would be appointed to lead discussions and act as the primary point of contact should there be any queries or complaints.

3.3.2. Community liaison and communication throughout the construction phase would be undertaken to provide information to people residing in properties located in the vicinity of the Order Limits. A **Community Liaison Group (CLG)** will be established, with the Applicant being required to submit to the relevant planning authority for approval of the terms of reference for the Community Liaison Group.

3.3.3. This group's aim is to facilitate liaison between representatives of people living in the vicinity of the Order Limits and other relevant organisations in relation to the construction of the Proposed Development. The community liaison would extend to landowners with livestock or other animals that may be present in fields adjacent to the construction works.

3.3.4. The level of engagement required would vary during the construction period, depending upon the likely impacts experienced by individual receptors due to the construction works.

3.3.5. Details relating to liaison with the local community would be managed by the Principal Contractor. It is envisaged that community liaison would

provide local residents with the following information in relation to the construction works:

- The nature of the works being undertaken;
- The expected duration of the works and the principal contractor's working hours;
- Mitigation measures that have been adopted to minimise noise and vibration; and
- Contact details in the event of a disturbance.

3.3.6. Any complaints will be directed toward the Community Liaison Lead, who will ensure that all necessary action/investigation is undertaken.

3.3.7. As a minimum, the Detailed Construction Environmental Management Pan must:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site. Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site;
- Undertake regular on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to Buckinghamshire Council when asked;
- Display the name and contact details of people accountable for air quality and dust issues with respect to the Proposed Development at the Main Construction Compound. This may be the Environment Manager/engineer or the Site Manager;
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the Local Planning Authority when asked;
- Carry out regular Site inspections to monitor compliance with the Construction Environmental Management Plan, record inspection results, and make an inspection log available to the Local Planning Authority when asked; and
- Increase the frequency of Site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

3.3.8. The above measures would also be in place for the decommissioning phase – as set out within the **Outline DEMP [EN010158/APP/7.4.2]**.

3.3.9. The Principal Contractor will liaise with Buckinghamshire Council to prepare a diary for local community events such as village fetes, farmer's markets, etc. Where possible, HGV traffic flows will avoid moving on these days

3.3.10. Secured by the **Outline CTMP [EN010158/APP/7.5.2],** to assist with general traffic management during the construction period, it is proposed that a Traffic Management Group (a potential subgroup of the CLG) be formed to help advise of progress, issues and to feedback public comments. The suggested structure of this group will likely include the following:

- Local Road Manager from Buckinghamshire Council;
- Local ward elected members;
- A representative from each of the neighbouring Parish Councils;
- A representative from the Police;
- The Site Manager;
- The CTMP Co-ordinator; and
- A senior member from the Applicant's development team.

3.3.11. This subgroup of the CLG will help co-ordinate works and provide a robust conduit for information and issues that may arise. It is suggested that it will meet as a minimum, every two months during the construction period.

3.3.12. A CTMP Co-ordinator will be appointed on Site and will be responsible for the implementation of the CTMP and the monitoring of its effectiveness. The Co-ordinator will also be the communication point for all external queries raised by members of the public, whilst also being the on site lead for the plan.

3.3.13. Prior to works commencing, the Co-ordinator will agree with Buckinghamshire Council the CTMP measures to be deployed on Site and will hold an initial meeting of the Traffic Management Group to advise all relevant groups of the start of works on Site, expected traffic levels and what measures are to be deployed.

3.3.14. Whilst these measures predominantly are in place to mitigate physical impacts, it is considered that full implementation of these measures will help to reduce negative perception and experience of construction activities in the local population.

3.3.15. During the operational (including maintenance) phase, the **Outline OEMP [EN010158/APP/7.3.2]** includes measures to minimise disruption to communities – including:

- The Site will generally be managed by 10 permanent staff per day during normal working hours (7 am to 7 pm) Monday to Friday, with additional staff attending when required for maintenance, replacement of equipment, vegetation management and cleaning;
- Security risk management threat assessments that will be conducted yearly at a minimum and also as needed to respond to any newly identified threat to safe and secure operation of a Site;
- CCTV cameras on-site will use night-vision technology which would be monitored remotely and remove the need for night-time lighting;
- No continual lighting, but manually operated and motion detection lighting to be utilised for safety purposes;
- The development of an Emergency Preparedness and Response Plan with the relevant local authority emergency planning officer, emergency services, outlining how flood warnings and other emergency events will be responded to;
- Maintaining a minimum 5 dB(A) reduction at source through refinement of the engineering requirements in order to adopt lower noise emitting transformers; and
- Informing the local community on key project milestones to maintain an ongoing relationship over the entire lifetime the project, in addition to providing contact details on site and online for members of the community to contact the asset operations team.

3.3.16. In addition, the **Outline LEMP [EN010158/APP/7.6.2]** requires the Applicant to consult with the CLG on relevant points of interest during the detailed design stage. This could include, for example, the location and content of interpretation boards and waymarking signage and options for planting alongside footpaths (height, species and density).

3.3.17. As set out within the **Outline RoWAS [EN010158/APP/7.8.2]**, where appropriate, signage will provide information on any alternative links, new links, details of works and contact information for the project team. The location and details of these signs will be discussed with the relevant planning authority/PRoW Officers.

3.3.18. As part of the Detailed Rights of Way and Access Strategy, a programme of PRoW diversions will be produced by the Applicant and its Principal contractor. Appropriate advanced notification will be provided to all relevant stakeholders prior to commencement.

3.3.19. A review of the PRoW and other pathway works would be undertaken regularly by the Applicant. Any improvements to arrangements would be discussed with the Traffic Management Group (a potential subgroup of the

Community Liaison Group), as described in the **Outline CTMP [EN010158/APP/7.5.2]**.

3.3.20. The detailed Rights of Way and Access Strategy will include name and contact details of the contractor's appointed person to allow the public to request information or raise issues.

4. Scope and Approach

4.1. Health Determinants and Pathways

Wider Determinants of Health

4.1.1. Mental and physical health[2] and wellbeing is influenced by a combination of biological and environmental factors. Biological factors are largely inherent. However, environmental factors can be influenced through design and management of development which may be able to impact on health outcomes.

4.1.2. Dahlgren and Whitehead's model [**Ref. 47**] of the main determinants of health illustrates the breadth of possible influences on health. Some factors are largely fixed, including individual age, sex, constitutional and genetic factors. Beyond this, there are also wider or broader determinants of health.

4.1.3. This model has been developed to show elements of the built environment and communities that are the key determinants of health. which have informed the scope of the health and wellbeing assessment.

4.1.4. Within a population there can also be health inequalities, defined by the WHO as "*differences in health status or in the distribution of health determinants between different population groups. For example, differences in mobility between elderly people and younger populations or differences in mortality rates between people from different social classes*" [**Ref. 48**]. The assessment of health and wellbeing effects therefore consider the significance of effects in relation to vulnerable groups, which determine the sensitivity of receptors.

4.1.5. An ever-growing body of research indicates that the environment in which we live is inextricably linked to our health, and whilst the causal links between development and health are often complex, research consistently reports that most health outcomes are influenced by factors other than genetics and healthcare [**Ref. 33**]. For example, the design of development can influence physical activity levels, travel patterns, social connectivity and mental and physical health outcomes.

4.1.6. These are recognised as the 'wider determinants of health' and include the following (as defined by the WHO and used by guidance such as that published by the Institute of Environmental Management and Assessment

[2] The World Health Organisation (WHO) defines health as a state of complete physical, mental and social well-being, and not the absence of disease or infirmity

(IEMA) (now ISEP) [**Ref. 29**] and Healthy Urban Development Unit (HUDU) [**Ref. 49**] – see **Table 1.**

Table 1 - Wider Determinants of Health (WHO)

Categories	Wider Determinants of Health
Health Related Behaviours	Physical activity
	Risk taking behaviours
	Diet and nutrition and access to healthy food
Social Environment	Housing, including design and affordability
	Relocation
	Access to open space, nature leisure and play
	Transport modes, accessibility, active travel and connections
	Community safety and crime
	Community identity, culture, resilience and influence
	Social participation, cohesion, interaction and support
	Access to health and social care services and other social infrastructure
Economic Environment	Education and training
	Employment and income
Bio-physical Environment	Climate change and adaption
	Air quality
	Water quality or availability
	Land quality
	Noise and vibration
	Radiation
Institutional and built environment	Health and social care services
	Built environment

Categories	Wider Determinants of Health
	Wider societal infrastructure and resources

Health Pathways

4.1.7. To determine potential health impacts, health pathways are identified. Health pathways are the mechanisms through which planning and development can affect health.

4.1.8. These are informed by an extensive literature review including the Marmot Review into Health Inequalities [**Ref. 44**] , Public Health England's Spatial Planning for Health evidence resource [**Ref. 32**] and the Environment Agency's scoping the environmental impacts of carbon capture, transport and storage guidance [**Ref. 50**].

4.1.9. Health pathways provide a qualitative approach to understand the potential effects. Health pathways do not produce predictable or equal health effects in individuals. When exposed to the same health pathway, different individuals may react differently as a result of a complex mixture of underlying levels of health, lifestyle factors and personal preferences and therefore aggregation at a population level is necessarily qualitative.

Mental Health and Wellbeing

4.1.10. Mental health and wellbeing is inextricably linked to physical health outcomes. The WHO, for example, states that 'there is no health without mental health' (WHO, 2022) [**Ref. 51**]. Mental health problems 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, so too can they impact on mental wellbeing. Mental health and wellbeing have been overtly and inherently referred to at a number of points within this Health Effects Report, and are intrinsically linked with other topic areas.

4.1.11. The mental health of every individual is influenced by their social setting, such as having the ability to earn enough money and feeling part of a community (Faculty of Public Health, 2016) [**Ref. 52**]. Community resilience can reduce the prevalence of mental health problems, increase the prevalence of good mental health and improve recovery and support for individuals (PHE, 2019) [**Ref. 53**].

4.1.12. The IEMA *"Guide to Effective Scoping of Human Health"* [**Ref. 29**]. makes specific reference to good practice in considering mental health and wellbeing (which is defined as the "*state in which every individual realises his or her own potential, can cope with the normal stresses of life, can*

work productively and fruitfully, and is able to make a contribution to her or his community") in developing EIA, noting that engagement can help to improve community understanding of the project and practitioner understanding of the community. Engagement can also actively alleviate particular impacts upon mental health, by providing a sense of control, inclusion and participation. Such engagement activities could be considered primary mitigation[3].

4.1.13. Moreover, general change and activity as a result of construction and operational activity – rather than linked to specific environmental effects – is raised by stakeholders as a contributor to mental and physical health.

4.1.14. Relevant health and wellbeing determinant(s)/pathway(s) include (see **Table 1**):

- Risk taking behaviours;
- Community safety and crime;
- Community identity, culture, resilience and influence; and
- Social participation, cohesion, interaction and support.

4.1.15. Through submissions via **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4] [APP-080]** and subsequent responses received to statutory and non-statutory consultation and through engagement, some organisations and members of the public have raised concerns around mental health and wellbeing including predominantly:

- The need for clear, transparent and meaningful engagement and consultation to demonstrate community feedback in considering the scheme design and the approach to mitigation measures;
- Environmental change – e.g. perceptions of visual/open countryside being industrialised – mental health can relate to the control people feel they have over their physical environment, for example in relation to topics such as noise[4] pollution or air quality;
- Footpaths, accessibility and active recreation – including PRoW diversions and the impacts these diversions will have on the community's freedom to walk in the local countryside; and noise and amenity value of PRoW. In the IEMA Guidance *"Determining Significance For Human Health In Environmental Impact Assessment"*

[3] The IEMA Guidance draws on evidence from (Cooke et al, 2011), which had previously defined a toolkit to assess and improve projects from the perspective of mental health and wellbeing identified four areas for consideration: enhancing control, increasing resilience, facilitating participation and promoting social inclusion.
[4] IEMA "Guide to Effective Scoping of Human Health" makes specific reference to noise in terms of mental health, through its effect on sleep disturbance and quality of life.

[**Ref. 30**] it is noted that there is a strong evidence base in the scientific literature for a causal relationship between physical activity and good physical and mental health;

- The potential for mental health effects relating to the loss of employment or socio-economic effects in the agricultural (and supporting) sectors;
- The potential for residential amenity to be affected, reducing house prices and financial stability, or reducing the ability to move house; and
- The need for a review of the health implications related to electromagnetic radiation, concern about which has the potential to raise stress and anxiety.

4.2. Determinants of Health for the Proposed Development

4.2.1. Not all of the wider determinants of health will be influenced by the Proposed Development – for example, there would be no displacement of residential property, and therefore the identified determinant 'Relocation' would not be relevant to the change experienced by receptors as a result of the Proposed Development.

4.2.2. This section sets out, for each potential environmental change, the relevant health and wellbeing determinant(s)/pathway(s) specific to the Proposed Development, and identifies the more vulnerable population or sub-population groups (sensitive receptors) relevant to this assessment.

Air Quality (including changes to concentrations of dust or particulates, release of harmful airborne gas, and the perception of air quality change)

4.2.3. Air quality is a key influence in the quality of the environment in which a population lives, with implications for long-term health. Poor air quality is associated with negative health outcomes, such as chronic lung disease, heart conditions and asthma, particularly among children.

4.2.4. **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** has assessed the increased risk of health effects due to release of dust and particulate matter emissions from the Proposed Development activities and road traffic exhaust emissions during the construction and decommissioning phases of development.

4.2.5. The impact of dust and road traffic exhaust emissions during the construction phase was quantified at sensitive receptors (e.g. residential properties, hospitals, schools and residential care homes) within 250m of the Order Limits.

4.2.6. **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** has also assessed the increased risk of health effects due to road traffic

exhaust emissions during the operation (including maintenance) phase of Proposed Development.

4.2.7. The impact of dust and road traffic exhaust emissions during the operational phase was quantified at human receptors (e.g. residential properties, hospitals, schools and residential care homes) within 250m of the Order Limits.

4.2.8. Measures are often required to ensure legal standards and thresholds for emissions and dust/particulates, which are based on health standards, are met at source – nonetheless, people may experience adverse mental health effects as a result of stress and anxiety related to the perception of change even if within appropriate thresholds (i.e. non-significant environmental effects in EIA terms).

4.2.9. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Air quality.

4.2.10. Sensitivity of receptors has been classified as follows in-line with standard guidance and legislative/policy thresholds applied in **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]**:

- **High** – Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).

  Examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.

- **Medium** – Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).

  Examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by health and safety at work legislation.

- **Low** – Locations where human exposure is transient.

  Examples include public footpaths, playing fields, parks and shopping streets.

4.2.11. The more vulnerable population groups (sensitive receptors) relevant to this assessment are therefore:

- Children and young people;

- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who as a result may spend more time at homes in close proximity to the Order Limits.

Noise and Vibration

4.2.12. Noise has tangible links to the health of a population, particularly in places where people live or work in close proximity to sources of noise. Excessive noise is associated with mental health illnesses, stress-related illness, memory and cognitive function and disturbances in sleep, although the definition of excessive is subjective and not uniform in a population.

4.2.13. Measures are often required to ensure legal standards and thresholds for noise, which are based on health standards, are met at source – nonetheless, people may experience adverse mental health effects as a result of stress and anxiety related to the perception of change even if within appropriate thresholds (i.e. non-significant environmental effects in EIA terms).

4.2.14. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Noise and vibration.

4.2.15. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- People with existing poor health (physical and mental health);
- Fixed-location community facilities and social infrastructure with a greater sensitivity to change as a result of their operations and characteristics of users (for example, with higher concentrations of people with different forms neurodiversity, such as autism); and
- People with geographical factors e.g. unemployed, disabled, shift workers who as a result may spend more time at homes in close proximity to the Order Limits.

Landscape and Visual Environment (including changes to the visual environment, landscape character and effects like Glint and Glare)

4.2.16. Visual amenity is a key influence in the quality of the environment in which a population lives, with implications for long-term health. Poor visual amenity is associated with increased stress and an overall diminished quality of life.

4.2.17. Visual effects relate to changes that arise in the composition of available public views as a result of changes to the landscape, to people's responses to the changes and to the overall effects with respect to visual amenity. Higher sensitivity (or susceptibility) is attributed to those living within view of the Proposed Development, as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective.

4.2.18. Stakeholders and members of the community have raised through response to statutory and non-statutory consultation, and through engagement, that change to the landscape character of the area as a result of the Proposed Development may have a wide-ranging detrimental impact on the desirability of the locality to live and visit, thus having a negative impact on residential amenity and enjoyment of where people live, resulting in effects on mental health and wellbeing.

4.2.19. The Applicant notes that assigning an effect on personal perception of the landscape and its mental health and wellbeing value is dependent on subjective interpretation of the landscape as a whole, and of individual views by an individual and collective set of receptors. Nonetheless, there are identified sensitive receptors in the area that have inherent recreational (such as PRoW) or cultural (such as the setting of Claydon House and Claydon Grade II Registered Park and Garden) value which may be affected by the change in visual environment.

4.2.20. **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** principally considers the impacts on public views. Receptors considered include users of PRoWs and other road networks, users of East West Rail, residents and visitors of local visitors/settlements, recreational and tourist receptors and landscape character areas.

4.2.21. However, **ES Volume 4, Appendix 10.5: Residential Visual Amenity Assessment [EN010158/APP/6.4] [APP-114]** also assesses potential effects on residential properties (i.e. *private* views) in terms of 'residential amenity', which are summarised in **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]**.

4.2.22. Guidance from the Landscape Institute Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA) (TGN 2/19) [**Ref. 54**] suggests that 'Residential Visual Amenity Assessment' is conducted to advise on whether a development will change the visual amenity of a property to such an extent that it becomes a matter of 'Residential Amenity'.

4.2.23. In turn, the RVAA assesses whether the Proposed Development would be 'over bearing' or 'dominating' at any residential property that the visual effect would be regarded as 'unpleasant' or 'unattractive' to live. This is assessed using the 'Residential Visual Amenity Threshold', which helps determine if the visual impact affects overall living conditions.

4.2.24. Glint and Glare effects also have the potential to cause visual disturbance which could result in poor visual amenity. This is often associated with increased stress and an overall diminished quality of life.

4.2.25. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Physical activity;
- Access to open space, nature leisure and play; and
- Community identity, culture, resilience and influence.

4.2.26. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who as a result may spend more time at homes in close proximity to the Order Limits.

Traffic, Transport and Access

4.2.27. There is the potential for health and wellbeing effects should changes to access (both for drivers and walkers, cyclists and horse riders (WCH)) prevent access between residential and community facilities, and/or dissuade individuals from walking or cycling (either recreationally or for other purposes).

4.2.28. There is a strong evidence base in the scientific literature for a causal relationship between physical activity and good physical and mental health. This relationship is influenced by a range of factors, including, but not limited to, the retention and promotion of access routes and the appeal of the outdoor, natural environment

4.2.29. Guidance referred to earlier in this Report also notes the positive mental health benefits related to the health determinants and pathways set out below.

4.2.30. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Physical activity;
- Access to open space, nature leisure and play;
- Transport modes, accessibility, active travel and connections;
- Community safety and crime;

- Social participation, cohesion, interaction and support; and
- Access to health and social care services and other social infrastructure.

4.2.31. The vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people; and
- People with existing poor health (physical and mental health).

Socio-economic Change (effects on business and commercial activity, employment and skills, and social cohesion)

4.2.32. Employment and income is intrinsically linked to health, with good quality employment leading to positive impacts on health and wellbeing, and the availability of high-quality jobs being key to achieving inclusive economic growth. In the same way, employment can also be associated with health inequality, with adverse physical and psychological conditions of work, the risk of job loss/redundancy and poor pay having the potential to have an adverse impact on human health (Pickett et al., 2006) [**Ref. 55**]. At an individual level, there are many factors that can influence people's emotional wellbeing/self-worth, including access to employment.

4.2.33. Poverty can further diminish an individual's sense of control. People in the lowest 20% of household incomes have an almost threefold increased risk of mental illness; a similar pattern is seen with unemployment (McManus et al., 2016) [**Ref. 56**] .

4.2.34. Research published by the UK Parliament considers that farmers and agricultural workers are at a particular high risk of mental health illness and suicide [**Ref. 57**]. Particular drivers of the mental health problems for agricultural workers include working long hours, living at work, family pressures, poor physical health and agricultural crime. Agricultural work and farming cultures can also bring about the problem of social isolation, caused by lone-working in isolated rural areas and the constant need to be available [**Ref. 58**].

4.2.35. Health impacts can also arise from financial insecurity which can contribute to a feeling of unpredictability and uncertainty amongst farm workers. Economic, regulatory and administrative pressures such as credit accessibility and reductions in bargaining power can also result in adverse mental health outcomes.

4.2.36. Effects may also result from changes in social cohesion, which may be influenced by factors including a change in the demographic profile or

resident population caused by temporary construction workforce locating within a community, or by changes in wider appreciation of community identity as a result of environmental change, access change, social mobility or appreciation of the environment, and the perception of a change in 'agency' within the community (including the ability to transparently observe and influence changes).

4.2.37. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Social participation, cohesion, interaction and support;
- Education and training; and
- Employment and income.

4.2.38. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who as a result may spend more time at homes in close proximity to the Order Limits.

Public Safety (including EMF and Radiation, Land and Water Safety (Contamination), and Major Accidents and Disasters)

4.2.39. For the Proposed Development, the risk of major accidents and disasters generally relates to the (very low) potential for battery failure and fire risk (including thermal runaway) and the subsequent effects on risk of injury or changes in environmental quality such as air quality, and contamination to land and water.

4.2.40. Beyond physical health, the perception of risk, or fear that major accidents may occur as a result of the presence of the infrastructure is also recognised as a health pathway as heightened anxiety and stress would result in a reduction in mental health and wellbeing.

4.2.41. As highlighted by the World Health Organization (WHO), EMF can be defined as physical fields that represents both the electric (created through differences in voltage) and magnetic (created when electric current flows) influences.

4.2.42. Relevant health and wellbeing determinant(s)/pathway(s) (see **Table 1**):

- Community safety and crime;
- (Electromagnetic) radiation;

- Air quality; and
- Water quality or availability.

4.2.43. The more sensitive vulnerable population groups (sensitive receptors) relevant to this assessment are:

- Children and young people;
- Older people;
- People with existing poor health (physical and mental health); and
- People with geographical factors e.g. unemployed, disabled, shift workers who as a result may spend more time at homes in close proximity to the Order Limits.

4.3. Methodology and Approach

Study Areas & Receptors

4.3.1. This report draws on the findings of related technical assessments within the ES. The geographical extent of health effects is dictated by the study areas used within the technical assessments that are of particular relevance the health determinants and pathways identified in **Table 1**.

Table 1 – Study Areas for ES Topics influencing Wider Determinants of Health

Health Determinant / Pathway	Study Area and Justification
Air Quality	The Study area/Zone of Influence (ZoI) for air quality is 250m from the Order Limits, influenced by the study area in **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** for human receptors for demolition, earthworks and general construction activities and based on the Institute of Air Quality Management (IAQM) construction dust guidance. This guidance inherently considers thresholds for effects on human health.
Noise	The Study area/ZoI for noise and vibration is 300m from the Order Limits, determined by guidance set out in BS 5228-1: 2009+A1: 2014 and BS 5228-2: 2009+A1: 2014.
Landscape and Visual Environment	The Study area/ZoI for landscape and visual effects is set at 6km from the Order Limits for the Proposed Development, which is considered both proportionate and adequate to

Health Determinant / Pathway	Study Area and Justification
	identify effects on landscape and visual receptors, including likely significant effects.
Traffic, Transport and Access	The Study area/ZoI for the effects on transport and access is based on roads that are expected to experience increased traffic flows associated with the construction of the Proposed Development. The study area includes the following road links most likely to be impacted by the proposed movements of associated with Rosefield Solar Farm: • The A34 to the southwest of Bicester; • The M40 to the north and south of Junction 9; • The A41 from its junction with the M40 through to Waddesdon; • Station Road/Dewes Lane from its junction with the A41 to the Buckingham Railway Centre; • Snake Lane/Fidlers Field from its junction at the Buckingham Railway Centre to its junction with Claydon Road; • Claydon Road from its junction with Snake Lane/Fidlers Field to its junction with Quainton Road/Granborough Road; and • Granborough Road between its junction with Claydon Road and the proposed Site access junction.
Land and Water Contamination	The Study area/ZoI for land, soil and groundwater effects is 1km from the Order Limits, determined with regard to identifying land, soil and groundwater related receptors that could be impacted by the construction, operation (including maintenance) and/or decommissioning of the Proposed Development. The extent of the study area allows for consideration of features that could require assessment if mobile groundwater conditions are evident
Population and Socio-economics	The spatial scale of the assessment was driven by the location and number of receptors, and the physical extent of environmental change to these individual receptors.

Health Determinant / Pathway	Study Area and Justification
	For employment and skills, the following are considered appropriate 'economic' or 'population' scale study/assessment areas: • Construction Labour Market Area (CLMA) (administrative geography that represents a 'best fit' for the area within 50 miles from the Order Limits); and • CLMA Focus Area (administrative geography that represents a 'best fit' for the area within 10 miles from the Order Limits). At the 'community' scale, guidance suggests the assessment of potential effects on relevant receptors is based on the location where users are likely to experience any disruption in terms of travel time and/or routing – and sets this at the area within the Order Limits, and within 500m of the Order Limits. While this is considered an appropriate default, the 'community' study area has been extended to include any parish within this area. The 'community study area' has been widened to ensure that specific receptors and effects of the Proposed Development are taken into account, given that the community is determined by very local characteristics. This includes giving light to the distribution of residential, neighbourhood and parish definitions, while noting community stakeholder feedback. and take into account the receptors, effects and characteristics of the Proposed Development and community determined by very local characteristics and the distribution of residential, neighbourhood or parish definitions, and community stakeholder feedback.

Magnitude of Change

4.3.2. In line with ISEP (formerly known as IEMA) Guidance [**Refs. 29 and 30**], effect **magnitude** is influenced by the levels and spatial scale of exposure to an effect, the frequency of the effect, the demonstrable relationship to mortality or changes in morbidity (physical or mental health) and change in quality-of-life. Duration of effect is also considered, with more weight given to long-term or permanent changes than to shorter-term or temporary ones.

Table 2 – Magnitude Criteria for Health and Wellbeing Effects

Magnitude	Definition
Large	• High exposure or scale; • Long-term duration; • Continuous frequency; • Severity predominantly related to mortality or changes in morbidity (physical or mental health) or very severe illness/injury outcomes; majority of population affected; • Permanent change; and/or • Substantial service quality implications.
Medium	• Low exposure or medium scale; • Medium-term duration; • Frequent events; • Severity predominantly related to moderate changes in morbidity (physical or mental health) or moderate change in quality of life; • Large minority of population affected; • Gradual reversal; and/or • Small service quality implications.
Small	• Very low exposure or small scale; • Short-term duration; • Occasional events; • Severity predominantly related to minor change in morbidity (physical or mental health) or moderate change in quality of life; • Small minority of population affected; • Rapid reversal; and/or • Slight service quality implications.
Negligible	• Negligible exposure or small scale; • Very short-term duration; • One off frequency; • Severity predominantly relates to minor change in quality of life; • Very few people affected; • Immediate reversal once activity complete; and/or • No service quality implications.

Sensitivity of Receptors

4.3.3. The sensitivity of a population's health and wellbeing is driven by a number of factors which are set out in **Table 3** below and are based on

guidance set out by ISEP (formerly known as IEMA) (IEMA, 2022) [**Refs. 29 and 30**] .

4.3.4. In general, populations and sub-populations are considered to have greater **sensitivity** if they experience higher levels of deprivation and wider pre-existing health inequalities, shared resources, higher levels of anxiety, uncertainty or concern relating to an intervention, and poor health indicators with an overall limited capacity to adapt to change.

Table 3 – Sensitivity Criteria for Health and Wellbeing Receptors

Sensitivity	Definition
High	• High levels of deprivation (including pockets of deprivation); • Reliance on shared resources; • 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.

Sensitivity	Definition
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 dependent); • People with good health status; and/or • People with a very high capacity to adapt.

Significance of Effects

4.3.5. The significance of health and wellbeing effects reflects the relationship between the sensitivity of the relevant population's health (or other relevant receptor), and the magnitude of the impact, as follows in **Table 4**:

Table 4 – Significance Matrix for Health and Wellbeing Effects

Sensitivity of Receptor	Magnitude of Impact			
	Large	**Medium**	**Small**	**Negligible**
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

4.3.6. Where two options are shown for the classification of effect (e.g. minor/negligible), professional judgement has been used to determine which of the two options is most appropriate.

4.3.7. In line with IEMA Guidance [**Ref. 30**], 'significant' health effects are those classified as moderate or greater (shown underlined in Table 4) and would generally mean that:

- Changes, due to the Proposed Development, have an *influential or substantial* effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders,

particularly public health stakeholders, that show *mixed views or consensus* on the importance of the effect.

- Change, due to the Proposed Development, could result in a regulatory threshold or statutory standard being *approached or crossed* (if applicable).
- There is likely to be a *small or substantial* change in the health baseline of the population, showing there is a *clear or causal* relationship between changes that would result from the Proposed Development and changes to health outcomes.
- In addition, health priorities for the relevant study area are of *general or specific* relevance to the determinant of health or population group affected by the Proposed Development.

4.3.8. In line with IEMA Guidance [**Ref. 30**], 'non-significant' (i.e. moderate or greater) health effects would generally mean that:

- Changes, due to the Proposed Development, have a *marginal* effect on (or 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 of limited policy influence and/or that *no relevant consultation themes* emerge among stakeholders.
- Change, due to the Proposed Development, 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 *very limited or slight* change in the health baseline of the population, showing there is an *unsupported* or at most *suggestive* relationship between changes that would result from the Proposed Development and changes to health outcomes.
- In addition, health priorities for the relevant study area are of *no or low relevance* to the determinant of health or population group affected by the Proposed Development.

4.3.9. Where an impact is identified, actions have been proposed to mitigate negative impacts on health where practicable, or to realise opportunities to create health benefits. It should be noted that in many cases, mitigation has been embedded within the design of the Proposed Development. Details of relevant embedded mitigation measures are set out and conclusions drawn as to likely significant effects (before additional mitigation) assume the implementation of this embedded mitigation.

4.3.10. The assessment of effects on health and wellbeing is influenced by the significance assessment undertaken by individual topic-specific assessments within the ES, and so these are referenced and reported within this chapter to provide context for the assessment of health and wellbeing effects. In some cases, physical and mental health is intrinsically

accounted for within standards and thresholds (for example for noise and air quality) to some extent.

4.4. Consideration of In-combination and Cumulative Effects

4.4.1. As set out in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act in combination. The following types of cumulative effects have been considered in accordance with the EIA Regulations and best practice guidance:

- **Intra-project (in combination)** effects – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor; and
- **Inter-project (cumulative)** effects – the combined residual (post-additional mitigation) effects of the Proposed Development and 'other existing development and/or approved development' on a single receptor/resource.

4.4.2. Regulation 5(2) of the EIA Regulations [**Ref. 1**] states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and the landscape.

In-Combination/Intra-project Effects

4.4.3. The IEMA Guide to Determining Significance for Human Health (November 2022) [**Ref. 30**] suggests that **in-combination** effects should be determined, and that this requires collating the effects identified (excluding negligible effects) for each determinant of health by population or subpopulation(s).

4.4.4. The IEMA Effective Scoping of Human Health in EIA Guidance (July 2022) [**Ref. 29**] provides advice that assessments should provide a narrative of likely interactions, and if appropriate a professional judgement as to a combined significance conclusion for a population or sub-population.

4.4.5. This may include multiple significance conclusions, for example one combining positive effects and one combining negative effects, and may then feed into a description of the appropriate mitigation.

4.4.6. The guidance also notes that:

- Interactions between determinants of health are complex as the changes may affect either the same or different risk factors; and independently, the same or different health outcomes;
- Whilst overlaps in health determinants occur, positive and negative health effects usually don't cancel each other out; and
- Similarly (and importantly), positives or negatives do not necessarily reinforce each other in combination - clearly stating whether a population experiences an overlap in effects from a range of determinants of health is usually more appropriate than calculating a net effect on public health.

4.4.7. For the Proposed Development, in-combination effects have been assessed in each of the relevant ES chapters (**ES Volume 2, Chapters 6 – 16**) in compliance with paragraph 5(2)(a) to (d) of the EIA Regulations 2017 [**Ref. 1**].

4.4.8. A review of the sensitive receptor (or sensitive receptor group) identified in each technical chapter, and whether the same receptor is exposed to more than one type of residual (post-additional mitigation) effect of 'slight/minor' significance or greater, during the construction, operation (including maintenance) and/or decommissioning phases of the Proposed Development has been completed. This has been undertaken using each of the summary tables presented in the final sections of relevant environmental topic assessments in **ES Volume 2**.

4.4.9. Mitigation measures have been identified in each individual chapter to minimise the individual effects, which will be secured through the implementation of relevant management plans and strategies.

4.4.10. **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** has identified that no health-relevant receptors are likely to experience significant in-combination/intra-combination effects during construction, decommissioning or operation (including maintenance).

4.4.11. Engagement and consultation has resulted in the understanding that members of the community are particularly concerned about the potential for in-combination environmental effects on change in access and environmental amenity (e.g. landscape and visual, noise and air quality) of public spaces (PRoW) during both the construction and operational (including maintenance) phases. These effects may lead people to avoid using PRoW or reduce their enjoyment of them for recreation, with consequent implications for physical and mental wellbeing.

4.4.12. In light of this, intra-project effects related to PRoW have been considered in Table 17.6 for **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**, and within this Report in terms of potential health

pathways influenced (e.g. access to open space and the natural environment).

Cumulative/Inter-Project Effects

4.4.13. The IEMA Guide to Determining Significance for Human Health (November 2022) [**Ref. 29**] suggests that the level of cumulative effects should be determined.

4.4.14. This means, for each determinant of health (or health pathway), listing the relevant reasonably foreseeable cumulative projects and using professional judgement (further sensitivity analysis is not required as the receptor remains the same, however magnitude should be appraised in light of the combined effect), providing a combined level of effect to reflect the likely implications for public health.

4.4.15. The priority is the identification of likely significant effects and the identification and description of any further mitigation necessary.

4.4.16. The guidance notes that:

- A combined public health effect is most likely where a population is affected by multiple determinants of health and a large proportion of the same individuals within that population experience the combination of effects.
- Some impacts are relatively localised, e.g., dust from a construction site, whilst others may be more far-reaching, e.g., job creation or noise along shared transport corridors.

4.4.17. The guidance also notes that an element of the cumulative assessment should articulate where a project contributes to a trend of incremental additional pressures on public health that whilst individually is not significant, collectively gives rise to significant public health effects.

4.4.18. For the Proposed Development, an assessment of the **inter-project cumulative effects** with other existing development and/or approved developments is undertaken, which includes East Claydon BESS (ID No.1), East Claydon Greener Grid Park (ID No.2), Tuckey Solar Farm (Id No. 3), HS2 (ID No. 5), Calvert Solar Farm (ID No. 7), East West Rail (ID No. 8) , Longbreach Solar Farm (ID No. 9) and the National East Claydon Substation as presented in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**.

4.4.19. This assessment considers the potential cumulative impacts of the Proposed Development alongside other nearby projects and outlines that no significant residual inter-project cumulative effects are anticipated, assuming the other developments have adequate mitigation in place.

4.4.20. Inter-Project Effects are considered in Sections 17.6 and 17.7 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**, in addition to within Tables 17.4, 17.7, 17.8 and 17.9.

4.4.21. Section 17.6 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** focuses on interactions between the Proposed Development and National Grid East Claydon Substation, while Section 17.7 shows cumulative socio-economic effects (relating to employment and economic activity including effects on construction, energy and agricultural and tourism sectors) at the population/economic scale[5].

4.4.22. The assessment considers the individual environmental effects that may have the potential to influence health pathways, for example – air quality, noise, transport and access, and socio-economics – that may have the potential to result in significant cumulative effects – this is summarised through a health and wellbeing lens in this Report (**Section 8**).

[5] 'population' effects should not be conflated with inter-project effects on population receptors (people, property and communities, community facilities etc) which are inherently the same receptors as considered through cumulative effects for individual environmental topics.

5. Health & Wellbeing Baseline

5.1. Defining Populations and Sub-Populations

5.1.1. In line with IEMA Guidance this report focuses on significant residual adverse effects identified through the EIA process which could have an impact on human health at a population level and, if relevant, a sub-population level (and not an individual level).

5.1.2. It is important to note that this Report does not seek to repeat baseline data presented within the ES, but considers the baseline information within these ES assessments that is of relevance to health and wellbeing.

5.1.3. Sub-populations(s) are identified in the IEMA guidance [**Ref. 29**] as those with vulnerability due to:

- Young age;
- Older age;
- Income or unemployment;
- Health status;
- Social disadvantage; and
- Access or geographic factors.

5.1.4. For the purposes of this baseline, a local ward area has been identified which includes the areas that the Order Limits falls within. These ward areas are based on the 2021 Census [**Ref. 59**] and are as follows:

- Great Brickhill;
- Grendon Underwood; and
- Winslow.

5.1.5. It is important to note that in absence of ward-level data, we have created a Middle Super Output Area (MSOA) best-fit area of the local ward areas[6].

5.2. Demographic Characteristics

5.2.1. According to the 2021 Census [**Ref. 59**], both Great Brickhill (59%) and Winslow (60%) are recorded to have lower proportions of working age

[6] The MSOA areas that form part of the best-fit of the local ward area are as follows: Buckingham South, Maids Moreton & Akeley (E02003652), Newton Longville & Great Horwood (E02003654), Marsh Gibbon, Steeple Claydon & Tingewick (E02003655), Winslow & Padbury (E02003656), Granborough, Stewkley & Great Brickhill (E02003657), Waddesdon & Whitchurch (E02003659), and Oakley, Brill & Edgcott (E02003661).

individuals when compared to proportions in Buckinghamshire (61%), the South East region (62%) and England. The proportion within Grendon Underwood is equal to the proportion at the regional level, but lower than the proportion at the national level.

5.2.2. Intuitively, the proportions of individuals over the age of 65 in Great Brickhill and Winslow (both at 23%) were recorded to greater than proportions at the local authority, regional and national levels.

5.2.3. The data suggests that the elderly population could be a sensitive age profile within the local area, with there being a slightly higher proportion of elderly people within the local wards when compared to the larger spatial scales in question. In addition to this, both young and elderly people could be more sensitive to impacts arising from the Proposed Development, due to these groups often spending more time at home, having slower reaction times and having a lower threshold in regards to noise and air quality effects.

5.2.4. This information has been corroborated through review of appendices to the Written Representation submitted by Claydons Solar Action Group at Deadline 1 **[REP1-128]**, which confirm that for the portion of the population assessed that is registered with a GP at the 3W Health practice:

- Local villages to the Site include an ageing demographic, with higher levels of chronic disease, mobility limitations, and reliance on local GP and community services;
- Such populations – and populations in rural areas more generally - are more sensitive to changes in access to local primary care as they may rely on private transport (including provided by friends and family) to access healthcare and community services; and

5.2.5. Older sub-populations are more likely to experience barriers to access for public healthcare and social isolation, higher rates of dependency and disability (including those in receipt of disability or attendance allowance), and higher prevalence of some major disease / health conditions including respiratory disease, frailty, dementia and multimorbidity.

5.2.6. Within the local area, the sex split is more weighted towards females in Great Brickhill and Winslow, accounting for 51% and 52% of residents respectively. This was in line with the sex split at the local authority, regional and national levels, while the sex split is more weighted towards males in Grendon Underwood.

5.2.7. Due to the ONS not providing statistics on the number of people who are pregnant, the total fertility rate (TFR) is used as a proxy [**Ref. 60**]. The latest available data from 2024 indicates that the TFR within

Buckinghamshire is slightly higher (1.58) than rates in the South East (1.43) and England (1.42).

5.2.8. The 2021 Census [**Ref. 59**] asked residents to self-assess their health, and the results suggest that residents in Great Brickhill, Grendon Underwood, Winslow and Buckinghamshire have a better self-perceived health (with 86% of residents reporting health to be 'very good' or 'good') than both the South East region and England.

5.2.9. Data from the 2021 Census [**Ref. 59**] on disability suggests that the local ward areas and Buckinghamshire are all recorded to have a lower proportion of individuals that have their day-to-day activities limited as a result of a disability or long-term health problem.

5.3. Health Baseline

5.3.1. The baseline section of **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** considers the demographic and economic context of study areas in line with the above sub-population characteristics, with Buckinghamshire recording a higher proportion of retired residents than the national average and generally and older and ageing population.

5.3.2. Baseline data presented in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** also indicates that the proportion of individuals who are economically inactive due to long-term sickness or disability is lower in Buckinghamshire than the regional and national averages, indicating there would be limited disproportionate effects on this group.

5.3.3. In addition to the baseline information in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**, the following section sets out health-specific baseline information that helps to identify the sensitivity of populations to environmental, economic and social changes that may have the potential to influence health pathways.

5.3.4. **Tables 5 and 6** provide a health summary to identify local health priorities. Most data is drawn from Office for Health Improvement and Disparities (OHID) Public Health Profiles [**Ref. 61**], supported by ONS and 2021 Census data [**Ref. 59**].

Table 5 – Health Profile Summary (Green = Better than England average; Yellow = Equal with England average; Red = Worse than England average)

Health Indicator		Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Health Outcomes							
Life Expectancy at Birth (years) 4-year range (2019 – 2023)	Male	n/a	n/a	n/a	81.3	-	79.1
	Female	n/a	n/a	n/a	84.9	-	83.0
Under 75 mortality rate from all causes considered preventable 1-year range (2024)	Directly standardised rate per 100,000	n/a	n/a	n/a	107.5	122.1	145.8
Under 75 mortality rate from cardiovascular disease (2024)	Directly standardised rate per 100,000	n/a	n/a	n/a	53.7	61.7	74.3
Under 75 mortality rate from cancer (2024)	Directly standardised rate per 100,000	n/a	n/a	n/a	100.7	109.3	117.9
Under 75 mortality rate from liver disease (2024)	Directly standardised rate per 100,000	n/a	n/a	n/a	14.9	17.0	20.1

Health Indicator		Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Under 75 mortality rate from respiratory disease (2024)	Directly standardised rate per 100,000	n/a	n/a	n/a	22.2	26.8	32.7
Suicide rate, directly standardised rate per 100,000 population (2022-2024)		n/a	n/a	n/a	9.7	10.4	10.9
Percentage of residents reporting depression or anxiety (2016/17)		n/a	n/a	n/a	10.1%	12.5%	13.7%
Emergency hospital admissions for coronary heart disease, standardised admission ratio (2016/17 – 2020/21)		74.9	68.5	72.9	72.2	-	100.0
Emergency hospital admissions for myocardial infarction (heart attack), standardised admission ratio (2016/17 – 2020/21)		85.7	74.6	72.3	86.8	-	100.0
Emergency hospital admissions for intentional self-harm, standardised admission ratio (2016/17 - 2020/21)		22.4	77.6	64.0	80.2	-	100.0
Utilisation of outdoor space for exercise or health reasons (March 2015)		n/a	n/a	n/a	17.4	18.2	17.9

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Percentage of adults meeting the '5-a-day' fruit and vegetable consumption recommendations (new method) (2023/24) (Persons, 16+ years)	n/a	n/a	n/a	36.5%	34.6%	31.3%
Risk Factors						
Excess weight in adults (2023/24) (percentage of adults aged 18 years over classified as overweight or obese)	n/a	n/a	n/a	65.9%	63.2%	64.5%
Excess weight (overweight and obese) prevalence in children (3 years data combined from 2022/23 - 2024/25) in Year 6	28.2%	30.9%	25.0%	30.4%	32.8%	36.2%
Excess weight (overweight and obese) prevalence in children (3 years data combined from 2022/23 - 2024/25) in Reception	21.2%	20.6%	22.9%	19.3%	21.1%	22.3%
Percentage of physically active adults (2022/23)	n/a	n/a	n/a	73.7%	70.5%	67.4%
Percentage of physically active children and young people (2024/25)	n/a	n/a	n/a	51.9%	48.2%	47.8%
Wider Determinants						

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Proportion living in fuel poverty (low income, low energy efficiency methodology) (2023)	n/a	n/a	n/a	8.5%	9.7%	11.4%
Percentage of households in fuel poverty (2020)	7.7%	7.8%	7.5%	7.3%	-	13.2%
Winter mortality index (%) (August 2021 – July 2022)	n/a	n/a	n/a	10.4%	8.6%	8.1%
Child poverty, income deprivation affecting children index (IDACI) (2019) (%)	5.0%	5.1%	6.6%	8.5%	-	17.1%
Older people in poverty, income deprivation affecting older people Index (IDAOPI) (2019) (%)	6.6%	6.2%	8.0%	7.7%	-	14.2%
Children in low income families (all dependent children under 20) (2023/24)	n/a	n/a	n/a	10.8%	12.3%	19.1%
16 to 17 year olds not in education, employment or training (NEET) or whose activity is not known (2023/24)	n/a	n/a	-	7.0%	6.8%	5.4%
19 to 24 year olds not in education, employment or training (%) (2021)	n/a	n/a	n/a	n/a	11.8%	13.2%

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Percentage of people in employment (%) (2024/25)	n/a	n/a	n/a	82.2%	78.4%	75.7%
Average attainment 8 score (2023/24)	n/a	n/a	n/a	51.4	47.1	45.9
Violent Crime (violent offenses per 1,000 population) (2024/25)	n/a	n/a	n/a	20.5	28.2	31.4
Number of people reported killed or seriously injured (KSI) on the roads, (per billion vehicle miles) (2024)	n/a	n/a	n/a	39.3	91.3	89.8
Pollution: fine particulate matter (concentration of PM2.5) (2024)	n/a	n/a	n/a	7.1	6.8	7.1
Fraction of mortality attributable to particulate air pollution (2024)	n/a	n/a	n/a	5.3%	5.1%	5.3%
The percentage of the population exposed to road, rail and air transport noise of 65dB(A) or more during daytime (2021)	n/a	n/a	n/a	3.2%	3.0%	4.3%
The percentage of the population exposed to road, rail and air transport noise of 55dB(A) or more during the night-time (2021)	n/a	n/a	n/a	6.4%	6.5%	8.4%

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
The rate of complaints about noise (per 1,000 population) (2023/24)	n/a	n/a	n/a	1.2	4.2	5.9

Source: OHID (2025)

Table 6 – Self-Reported Health Summary (Green = Better than England average; Yellow = Equal with England average; Red = Worse than England average)

Health Indicator	Great Brickhill	Grendon Underwood	Winslow	Buckinghamshire	South East	England
Self-Reported General Health (Census 2021)						
'Very Good' and 'Good'	86%	86%	86%	86%	84%	82%
'Fair'	10%	11%	11%	10%	12%	13%
'Bad' and 'Very Bad'	3%	3%	3%	3%	4%	5%
Self-Reported General Health (Census 2021)						
Day-to-day activities limited a little	9%	9%	10%	9%	10%	10%
Day-to-day activities limited a lot	5%	5%	5%	5%	6%	7%

5.4. Health Outcomes

5.4.1. Data from OHID Public Health Profiles [**Ref. 61**] on life expectancies presented in **Table 2** are collected from 2019 to 2023. This data is currently not available at the ward level but is available at the Middle Super Output Area (MSOA) level. In absence of ward-level data, we have created an MSOA best-fit area of the local ward areas.

5.4.2. Life expectancy at birth for men in Buckinghamshire (81.3 years) is recorded to be greater than the rate at the national level (79.1 years), and average rate across the local ward area (82.0 years). When looking at the MSOAs that make up the local ward area, Granborough, Stewkley & Great Brickhill were recorded to have the highest life expectancy for men (82.4 years), while Marsh Gibbon, Steeple Claydon & Tingewick was recorded to have the lowest life expectancy for men (81.1 years).

5.4.3. Buckinghamshire was also recorded to have a higher life expectancy for women (81.3 years), but was recorded to have a lower life expectancy for women when compared against the average across the local ward area (85.1 years). The high average life expectancy for women within the local ward area is driven by particularly high life expectancies for women across Granborough, Stewkley and Great Brickhill (86.0 years), Oakley, Brill and Edgcott (86.0 years) and Newton Longville and Great Horwood (85.5 years).

5.4.4. The 2021 Census [**Ref. 59**] asked residents to self-assess their health, and the results suggest that residents in Great Brickhill, Grendon Underwood, Winslow and Buckinghamshire have a better self-perceived health (with 86% of residents reporting health to be ‘very good’ or ‘good’) than both the South East region and England.

5.4.5. Data from the 2021 Census [**Ref. 59**] on disability suggests that the local ward areas and Buckinghamshire are all recorded to have a lower proportion of individuals that have their day-to-day activities limited as a result of a disability or long-term health problem.

5.5. Risk Factors

5.5.1. The evidence base for the Buckinghamshire Joint Needs Assessment includes the Joint Local Health and Wellbeing Strategy 2025 – 2035 (DRAFT) [**Ref. 23**]. The Strategy sets out the aims and priorities in terms of local health, which focus on making a visible difference to health outcomes and reducing inequalities across the county, while putting residents at the heart of the actions.

5.5.2. There are three priority action areas: Start well, Live well and Age well. Particular emphasis is placed on improving mental health support for all

age-groups: children, young people, working-age people and the elderly, reducing prevalence of obesity, rates of cardiovascular disease and improving places and helping communities to support healthy aging.

5.5.3. According to data from 2022/23 to 2024/25, the prevalence of excess weight within year 6 children is lower in the Local Ward areas and Buckinghamshire when compared to regional and national proportions. Conversely, the prevalence of excess weight for reception-aged children within Winslow is higher than both the regional and national averages, highlighting the current obesity issues that the local area faces.

5.5.4. 2023/24 data from OHID suggests that prevalence of overweight or obese adults is higher within Buckinghamshire (65.9%) when compared to proportions in the South East (63.2%) and England (64.5%). Significant inequalities exist across the county, with a disproportionate number of those living in the more deprived communities more likely to be affected by obesity.

5.5.5. 2023/24 Data from the Department of Health and Social Care [**Ref. 61**] suggests that the percentage of physically active adults stands at 73.7% in Buckinghamshire, which is higher than proportions at the regional (70.5%) and national (67.4%) levels. 2024/25 OHID data suggests that there are a lower proportion of physically active children and young people in Buckinghamshire (48.1%) when compared to proportions at the regional (49.5%) and national (49.1%) levels.

5.5.6. Anecdotal information provided in Written Representation submitted by Claydons Solar Action Group at Deadline 1 **[REP1-128]** add to the health baseline in terms of risk factors that for the portion of the population assessed that is registered with a GP at the 3W Health practice – noting that:

- Prevalence of Stroke / TIA within patients registered at the practice is estimated at 1.8% to 2.5% compared to a national average of 1.7%, which may reflect the ageing demographic; and
- Prevalence of Hypertension and Coronary Heart Disease within patients registered at the practice are estimated at slightly higher than national average rates, which may reflect the ageing demographic.

5.6. Mental Health

5.6.1. Mental health and physical health are intricately linked: poor physical health can cause mental health problems and vice versa. Those that suffer from obesity, substance misuse, smoking, cancer and cardiovascular disease are particularly likely to also have a mental health problem.

5.6.2. Having a chronic physical condition was also associated with having a lower level of mental wellbeing. Chronic health conditions (including asthma, cancer, high blood pressure) have a strong association with mental ill-health [**Ref. 62**]. In people with severe "common medical disorders (CMD)", 37% reported a chronic physical condition [**Ref. 62**].

5.6.3. Improving mental health has also been identified as a priority within the Buckinghamshire Joint Local Health and Wellbeing Strategy [**Ref. 23**], with the strategy highlighting the need to address mental health inequalities.

5.6.4. Suicide is a significant cause of death in young adults (when considering the overall mortality rate of this group) and is an indicator of underlying rates of mental ill-health. The suicide rate within Buckinghamshire is recorded to be 9.7 per 100,000 population, which is lower than rates at the regional (10.4) and national (10.9) levels.

5.6.5. Intuitively, the proportion of residents reporting depression or anxiety is lower within Buckinghamshire (10.1%) when compared to proportions at the regional (12.5%) and national (13.7%) levels.

5.6.6. Anecdotal information provided through appendices to the Written Representation submitted by Claydons Solar Action Group at Deadline 1 [**REP1-128**], confirm that for the portion of the population assessed that is registered with a GP at the 3W Health practice, depression rates are estimated in the range of 11-14%.

5.6.7. Data on personal wellbeing from the ONS [**Ref. 63**] also indicates that the wellbeing levels including life satisfaction, happiness and the feeling that living is worthwhile are higher in Buckinghamshire than the regional and national averages, while anxiety levels are slightly higher than the national average.

5.6.8. Data from OHID Health Profiles suggests that the standardised ratio of emergency hospital admissions for intentional self-harm is lower in Buckinghamshire when compared to the national average. Regarding the local population, the rate of emergency hospital admissions for intentional self-harm, as a general indicator relevant to mental health, is also significantly lower across local three wards when compared to the national level.

5.6.9. Data from the 2021 Census [**Ref. 59**] suggests that the percentage of people who cannot speak English well or at all is lower within the local wards and Buckinghamshire when compared to the national average.

5.7. Air Quality

5.7.1. Poor air quality and air pollution can be recognised as contributing factors towards cancer, heart disease, increases in hospital admissions, exacerbation of asthma and mortality. Air pollution is known to have a particular effect on the elderly population, children, and those with pre-existing health conditions, with air pollution expected to be responsible for a reduction in healthy life expectancy equivalent to 29,000 to 43,000 deaths per year.

5.7.2. Buckinghamshire Council's Air Quality Action Plan (2024 – 2030) [**Ref. 64**] identifies that air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas.

5.7.3. It highlights that Buckinghamshire is committed to reducing the exposure of local people to poor air quality to improve health.

5.7.4. The main source of air pollution in Buckinghamshire is from road transportation. Nitrogen dioxide (NO2) is the major pollutant of concern with nine Air Quality Management Areas (AQMAs) designated by the Council for exceedances of NO2 meaning that air pollution exceeds the national norms.

5.7.5. 2024 OHID data suggests that the concentration of PM2.5 within Buckinghamshire (7.1 µg/m^3) is greater than the concentration at the regional level (6.8 µg/m^3), and equal to the concentration at national level. In addition to this, the fraction of mortality attributable to particulate air pollution within Buckinghamshire (5.3%) is also recorded to be higher than the regional rate (5.1%) and equal to the national rate. This data suggests that Buckinghamshire may face a slightly higher health burden from air pollution when compared to the wider region.

5.7.6. When looking at the site specific population, emergency hospital admissions for coronary heart disease and myocardial infarction (heart attack) are all significantly lower within the local wards when compared to regional and national levels, noting that air quality is only one contributing factor to these admissions.

5.7.7. Further relevant information has been provided through appendices to the Written Representation submitted by Claydons Solar Action Group at Deadline 1 [**REP1-128**], which confirm that for the portion of the population assessed that is registered with a GP at the 3W Health practice:

- Around 6-8% of patients experience asthma;
- Around 1.2-2% experience COPD; and
- Around 8-10% are estimated to experience long-term respiratory disease (combined risk groups).

5.8. Noise and Vibration

5.8.1. Very high noise levels can have direct impacts on health (hearing loss or tinnitus)[7]. Lower levels (nuisance or annoyance levels) have indirect health effects including through stress-related illness and disturbances in sleep. These nuisance levels do not affect people equally. Nuisance and annoyance can have higher or lower relative importance assigned by those affected by them. Such importance varies within and across populations, and this importance or variability can be uncertain [**Ref. 65**]. As such it is challenging to predict with any certainty the degree to which nuisance and annoyance from noise will affect people at an individual level.

5.8.2. When looking at environmental health factors, only 3.2% of Buckinghamshire residents were recorded to be exposed to road, rail and air transport noise of 65dB(A) or more during daytime – this was slightly higher than the South East (3.0%) and lower than England average (4.3%).

5.8.3. The rate of complaints per 1,000 population about noise in Buckinghamshire (1.2) is lower than rates at the regional and national levels (4.2 and 5.9, respectively).

5.9. Other Wider Determinants

5.9.1. Data from the Department of Health and Social Care [**Ref. 61**] indicates that Buckinghamshire has lower rates of children in poverty and older people in poverty in comparison to national proportions. When looking at MSOA data on income deprivation affecting people, Waddesdon and Whitchurch is recorded to have the highest proportion of children in poverty (9.8%), while Winslow and Padbury was recorded to have the highest proportion of older people in poverty (8.8%).

[7] Noise exposure level beyond 80 dB during 40 years of working a 40 hour work week can give rise to permanent hearing impairment. Given that environmental exposure to noise is much lower than these levels and that noise-related hearing impairments are not reversible, the GDG considered that there should be no risk of hearing impairment due to environmental noise and considered any increased risk of hearing impairment relevant. WHO, (2018). Environmental Noise Guidelines for the European Region, p. 23 [**Ref. 65**].

5.9.2. This is also true for rates of children in low income families, with proportions of 10.8% in Buckinghamshire, compared to a higher rates of 12.3% and 19.1% at the regional and national levels, respectively.

5.9.3. When looking at other socio-economic health outcomes, Buckinghamshire was also recorded to have a higher proportion of residents in employment and a higher average attainment 8 score when compared to the regional and national levels. Contrastingly, the proportion of 16 to 17 year olds not in education, employment or training (NEET) or whose activity is not known in 2023/24 was higher in Buckinghamshire (7.0%) than in the South East (6.8%) and England (5.4%).

5.9.4. The rates of violent offences per 1,000 people in 2024/25 is recorded to be lower in Buckinghamshire (20.5) when compared to the South East (28.2) and England (31.4). Similarly, the number pf people reported killed or seriously injured on the roads was also lower than the regional and national levels.

5.10. Deprivation Associated with Poor Health

5.10.1. The Government's Index of Multiple Deprivation (IMD) (2025) [**Ref. 66**] measures deprivation by combining a range of social, economic and housing factors, to establish a single deprivation score and rank for each small area (Lower-layer Super Output Area, LSOA) across England. All LSOAs are ranked relative to one another according to their level of deprivation.

5.10.2. There are seven "domains" of deprivation, outlined as follows:

- Income deprivation;
- Employment deprivation;
- Education, skills and training deprivation;
- Health deprivation and disability;
- Crime;
- Barriers to housing services; and
- Living environment deprivation.

5.10.3. IMD (2025) data suggests that deprivation within Buckinghamshire is relatively low but there are pockets of high deprivation (areas ranked within the top 10%-20% and top 20%-30% of most deprived in the country) in Aylesbury, High Wycombe and Chesham.

5.10.4. Health deprivation and disability measures *"the risk of premature death and the impairment of quality of life through poor physical or mental*

health". Measures of health include morbidity, disability and premature mortality.

5.10.5. The Site does not fall within the top 30% most deprived areas in England for the Health domain. In fact, there are no LSOA areas within any of the three local wards to the Site that are within the top 50% of most deprived areas in England – suggesting these areas are all less deprived in terms of health than the average for England.

5.10.6. More widely within Buckinghamshire, there are some pockets of health deprivation within Buckingham, Aylesbury and High Wycombe where there are some LSOAs which fall amongst the top 10%-20% most deprived for the health domain.

5.11. Equality and Sensitivity of Vulnerable Groups

5.11.1. Within a defined population, individuals will range in their levels of sensitivity to health outcomes due to factors such as age, socio-economic deprivation and pre-existing health conditions. It is clear that some groups may be particularly vulnerable to changes whereby they could experience differential or disproportionate effects when compared to the general population.

5.11.2. The **Equality Impact Assessment [EN010158/APP/7.12] [APP-148]** notes that while the defined Local Area (Grendon Underwood and Great Brickhill wards) does not have a particularly sensitive age profile, it is clear that both younger and older residents may be more affected by the Proposed Development.

5.11.3. This is due to the fact that elderly residents are more likely to be at home during the day and more susceptible to changes in accessibility and air quality, while younger children will have daytime sleep patterns and may have slower reaction times to changes in traffic patterns.

5.11.4. Disability may also influence the sensitivity of a population, for example to changes in environmental amenity and accessibility. The proportion of individuals that were disabled under the Equality Act [**Ref. 9**] and had day to day activities limited was lower in Buckinghamshire when compared to the South East and England averages.

5.12. Land Use Change and Development in the Local Area

5.12.1. It is acknowledged that the community in this area has experienced substantial change and development of nationally significant infrastructure in the period preceding the application for the Proposed Development – for example given the close proximity to High Speed 2 works, which while not accounted for within the standard cumulative effects assessment

methodology, is likely to have influenced the prevailing sensitivity to change and would therefore influence health and wellbeing effects experienced as a result of the Proposed Development more acutely than if the community had not had recent and long-term exposure to such works.

5.13. Conclusion of Health Baseline

5.13.1. Based on the baseline profile and the national, regional and local policy in relation to health, the Applicant has identified that the general population is considered to be of medium sensitivity.

5.13.2. Overall, populations with a higher sensitivity to health effects related to environmental change resulting from the Proposed Development are anticipated to be:

- Children and young people;
- Older people;
- Socially disadvantaged, e.g. low income, those experiencing discrimination;
- People with existing poor health (physical and mental); and
- People with access and geographical factors, e.g. unemployed or shift workers who as a result may spend more time at home.

5.13.3. Based on the baseline profile, and the national, regional and local policy in relation to health, the Applicant has identified the following health priorities:

- Promoting mental health and wellbeing and improving the level of care available for those suffering from mental health issues;
- Tackling inequality across the county;
- Tackling the levels of obesity and related life choices; and
- Working to prevent long-term health conditions such as cardiovascular disease.

6. Mitigation Embedded into the Design

6.1. Overview of Iterative Design Development

6.1.1. A **Design Approach Document [EN010158/APP/5.8.2]** has been submitted as part of the DCO Application which demonstrates how the Proposed Development would fulfil the requirement for good design, both in terms of good design as a process and good design outcomes.

6.1.2. The **Design Approach Document [EN010158/APP/5.8.2]** sets out how good design aspirations and intentions have cascaded through the design process and how these tangibly manifest themselves as good design outcomes that support sustainable development.

6.1.3. In most cases, these iterative design changes have been influenced by the potential to reduce or avoid adverse environmental effects which would be determinants of health and wellbeing, and/or in response to feedback and concerns raised by statutory bodies and members of the community.

Principles for Stage 1 Design

6.1.4. All existing PRoW within the Order Limits were retained on their existing alignment, with a commitment to consider opportunities to enhance routes and/or establish new routes for people to enjoy (Project Principles 2.3 and 9.4)

6.1.5. Solar PV development was offset from residential properties along Calvert Road, at Calvert Cottages and Catherine Cottage, and at Pond Farm, to reduce potential effects on residential properties and residential amenity

Principles for Stage 2 Design

6.1.6. Parts of Fields B4, B5, B6, B13 and B22 were no longer proposed for Solar PV development to provide larger setbacks from residential properties and PRoW. To reflect the outputs from initial site visits and residential visual amenity assessments undertaken at nearby residential properties, bespoke offsets were provided for each individual property (Principles 2.2, 2.3 and 6.3).

6.1.7. Diversions were indicated to three existing PRoWs (SCL/13/1, SCL/12/2 and SCL/13/2) to rationalise them into a single PRoW, providing access between Pond Farm and Calvert Road. This permanent diversion would also allow the diverted route to connect into the PRoW network north of Calvert Road at a closer point than the existing location (Principles 2.3 and 9.2).

6.1.8. The location of a potential new permissive footpath was indicated across Parcel 1, following from Phase One Consultation, connecting the to-be-rationalised PRoW SCL/13/2 to Three Points Lane, via the southern edge of Shrubs Wood and the top of Knowl Hill (Field B17) (Principles 2.3, 9.1 and 9.2).

6.1.9. Fields D8, D9, D18 and D19 were no longer proposed as an option for the Rosefield Substation, to reduce potential noise and visual effects for residents of Botolph Claydon and individual properties, with proposed locations taken forward being located closer to the existing National Grid East Claydon Substation (Principles 2.2, 2.3, 6.1 and 7.1).

Stage 3 Design (informed by Phase 2 Consultation)

6.1.10. Field B5 and parts of Fields B22 and B23 (North) are no longer proposed for Solar PV development to provide larger setbacks from residential properties. To reflect the outputs from further site visits and residential visual amenity assessments undertaken at nearby residential properties, bespoke offsets have been provided for each individual property (Principles 2.2, 2.3 and 6.3).

6.1.11. The location of a second potential new permissive footpath, to connect the permissive footpath proposed at Stage 2 to the PRoW network north of Calvert Road has been added, beginning from the intersection of Fields B17, B20 and B21, then running north to the west of B21 and B22 to Calvert Road and onwards to PRoW MCL/13/1 (Principles 2.3, 9.1 and 9.2).

6.1.12. An additional diversion has been proposed to the existing PRoW SCL/13/2 in the south of Parcel 1 (between Shrubs Wood and Decoypond Wood) to align the PRoW Footpath with the field boundary of Field B7 and reduce visual impacts for user of the PRoW (Principles 2.3 and 9.2).

6.1.13. A new permissive footpath across Parcel 2 which connects the existing PRoW ECL/8/1 to PRoW ECL/9/2 and ECL/10/2, along the north of D3 (South), creating a new circular route (Principles 2.3, 9.1 and 9.2).

6.1.14. An additional diversion has been proposed to the existing PRoW ECL/7/2 in the east of Parcel 2, to align the PRoW Footpath with the field boundary of Field D19 and reduce visual impacts for users of the PRoW (Principles 2.3 and 9.2).

Embedded Mitigation for Air Quality

6.1.15. Several mitigation measures have been embedded into the Proposed Development as part of an iterative design process, resulting in the following being secured for the function of minimising the construction dust

and exhaust emission impacts from the Proposed Development to residential properties and users of PRoW:

- The Proposed Development design will incorporate a minimum offset distance of 50m from ITS (Inverter and Transformer Stations) from all residential receptors – secured by the **Design Commitments [EN010158/APP/5.9.3]**;
- There will be a minimum 10m offset from all perimeter fencing surrounding the Solar PV development to existing public rights of way – secured by the **Design Commitments [EN010158/APP/5.9.3]**;
- Construction traffic routes have been designed to avoid passing any of the sensitive villages in close proximity to the Site, and residential receptors where possible to minimise disruption to local communities – secured by the **Outline CTMP [EN010158/APP/7.5.2]** and **Outline DEMP [EN010158/APP/7.4.2]**.

6.1.16. The embedded mitigation has been established based on Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction [**Ref. 67**]

Embedded Mitigation for Noise

6.1.17. Several mitigation measures have been embedded into the Proposed Development as part of an iterative design process, resulting in the following being secured for the function of reducing noise impact at the nearest noise sensitive receptors/residential properties:

- Maximising the separation distance between proposed infrastructure and surrounding sensitive receptors, where practicable – secured by the **Works Plans [EN010158/APP/2.3.3]** and the **Design Commitments [EN010158/APP/5.9.3]**;
- Use of equipment with low noise emissions, where feasible – secured by the **Outline CEMP [EN010158/APP/7.2.2]**, **Outline OEMP [EN010158/APP/7.3.2]** and **Outline DEMP [EN010158/APP/7.4.2]**; and
- Orientating noise emitting equipment to reduce noise level beyond the Order Limits – secured by the **Outline CEMP [EN010158/APP/7.2.2]**, **Outline OEMP [EN010158/APP/7.3.2]** and **Outline DEMP [EN010158/APP/7.4.2]**.

Embedded Mitigation for Landscape and Visual Amenity (including Glint and Glare)

Embedded Mitigation for Effects relating to Landscape and Visual Amenity

6.1.18. The Applicant has developed the design of the Proposed Development to provide a sensitive response to the local environment and reduce potential impacts in accordance with the Project Principles set out in the **Design Approach Document [EN010158/APP/5.8.2]**.

6.1.19. The design includes embedded screening measures to reduce visibility where possible, while additional mitigation measures include the adoption of the following management plans:

- **Outline CEMP [EN010158/APP/7.2.2]**;
- **Outline LEMP [EN010158/APP/7.6.2]**;
- **Outline SMP [EN010158/APP/7.7.2]**; and
- **Outline DEMP [EN010158/APP/7.4.2]**.

6.1.20. Changes to visual amenity on PRoW will be mitigated against as far as is reasonably practicable, in the form of new hedgerow planting or structural planting belts. Several design measures have been embedded into the Proposed Development as part of an iterative design process, resulting in the following being secured for the function of avoiding or reducing the significance of landscape and visual effects:

- New hedgerow planting to footpath within Fields B1 and B4 to soften views and provide medium long term screening of views from PRoW SCL/12/1;
- New hedgerow planting along the western boundary of Field B5, adjacent to Pond Farm access to soften views and provide medium and long term screening of views from the access track to properties and Calvert Road;
- Hedgerows to the south of Calvert Road and east of Claydon Road to be gradually increased in height to 3.5m to soften views and provide screening from Calvert Road and Claydon Road;
- 15m width belt of structural native woodland (advanced) planting along northern and southern boundaries of Field B5 soften views/provide screening of Solar PV modules from Calvert Cottages and footpath diversions;
- 30m width buffer of species rich grassland and scrub to Decoypond Wood (Field B7) to provide screening of Solar PV modules from footpath conversion;

- 50m width buffer of species rich grassland and scrub to Shrubs Wood (Fields B6 and B10) to provide screening of Solar PV modules from footpath diversions and proposed permissive footpath to Knowl Hill;
- New hedgerow (advanced) planting to the eastern boundary of Solar PV modules in Field B22, and north of Field B23 (North) to soften/screen views of Solar PV modules and Satellite Collector Compound from Calvert Road, Catherine Cottages and Blackmorehill Cottages;
- Infill hedgerow planting and strengthening of avenue of poplar trees to Three Points Lane to soften/screen views of Solar PV modules and Satellite Collector Compound from Calvert Road and Claydon Park;
- 15m width belt of structural native woodland (advanced) planting along northern boundary of Field D3 (South) to provide screening from PV modules from Botolph Claydon and PRoW ECL/9/2 and ECL/10/1;
- New hedgerow/infill planting to the eastern and western boundaries Fields D3 (South), D12 and D13 to soften/screen views of Solar PV modules and Satellite Collector Compound from Bernwood Jubilee Way/ PRoW ECL/8/1;
- 50m width buffer of species rich grassland and scrub to Runt's Wood (Fields D28 and D29) to provide screening of views of Solar PV modules from PRoW ECL/8/2 and permissive footpath between PRoW ECL/8/2 and QUA/42/2;
- 15m width belt of structural native woodland (advanced) planting along southern boundary of Fields D8, D9, D19 and D26 to screen views of Solar PV modules, Satellite Collector Compound and BESS from Claydon Road, Hogshaw Farm and PRoW HOG/7/1;
- 15m width belt of structural native woodland (advanced) planting along western boundary of Fields E11, E20, E21, E22 and E23 to screen views of Solar PV modules, Main Collector Compound and Rosefield Substation from Botolph Claydon, Sion Hill Farm, Bernwood Jubilee Way, North Buckinghamshire Way/Midshires Way and PRoW ECL/4/1;
- New hedgerow planting to northern edge of Solar PV modules in Field E23 to provide screening of views from North Buckinghamshire Way/Midshires Way/ PRoW ECL/5/1;
- Structural planting will consist of native and indigenous species and wherever possible be of local provenance to ensure that new planting complements existing habitats;
- Grassland open fields and margins with species rich grassland throughout the Site for biodiversity purposes;

- Perimeter fencing surrounding the Solar PV development will be offset at least 15m from existing woodlands and at least 10m either side from all existing hedgerows to protect and retain existing trees and hedgerows;
- Perimeter fencing surrounding the Solar PV development will not be constructed through existing hedgerows or across ditches where practicable to protect and retain existing trees and hedgerows; and
- Perimeter fencing surrounding the Solar PV development will be offset at least 15m from either side of existing and proposed statutory PRoW to maintain visual amenity of users of PRoW.

Embedded Mitigation for Effects relating to Glint and Glare

6.1.21. Solar PV modules are specifically designed to absorb light rather than reflect it. Light reflecting from Solar PV modules results in the loss of energy output. Solar PV modules are dark in colour due to their anti-reflective coatings and are manufactured with low-iron, ultra-clear glass with specialised coatings and textures to enable maximum absorption.

6.1.22. The combination of these factors significantly increases electrical energy production of the panels and at the same time significantly reduces reflected rays.

6.1.23. Mitigation to reduce the glint and glare potential impacts, in the form of vegetation planting screening 3m above ground level, is embedded within the design and is presented within **Appendix 1: Green and Blue Infrastructure Parameters** of the **Outline LEMP [EN010158/APP/7.6.2]**.

Embedded Mitigation for Traffic, Transport and Access

6.1.24. Several mitigation measures have been embedded into the Proposed Development as part of an iterative design process, resulting in the following being secured for the function of removing construction traffic from villages, reducing adverse impacts in sensitive areas, and ensuring access and road/PRoW safety and efficiency for all users:

- The proposed construction access route avoids passing through villages, and all HGV traffic for the BESS and north eastern portion of the Site will be routed through the main access and will approach Granborough Road from Quainton Road, removing the need for a constrained 90 degree turn at the junction, ensuring road safety and efficiency for all users and reducing the need for intrusive road enhancement works. Routing requirements are set out in **Outline CTMP [EN010158/APP/7.5.2]**; and

- The construction and operational site access junctions are designed to allow for two-way traffic flows and sufficient visibility in all directions, ensuring road safety and efficiency for all users – secured via the **Draft Development Consent Order (DCO) [EN010158/APP/3.1.3]**.

6.1.25. The design of the Proposed Development also includes diversions to PRoWs, and the provision of new recreational and connectivity-providing permissive paths, as set out within the **Outline RoWaAS [EN010158/APP/7.8.2]**, **Streets, Rights of Way and Access Plans [EN010158/APP/2.4.3]** and the **Draft DCO [EN010158/APP/3.1.3]**.

6.1.26. The following PRoWs would be diverted during the construction phase and for the duration of the operation (including maintenance) phase:

- A diversion to the existing PRoW Footpath (reference 'ECL/4/2') (463m to be stopped up) to the north of Parcel 3 to align the PRoW Footpath with the field boundaries of Fields E10 and E11, rather than crossing Field E11 (new length 559m), resulting in a 21% increase in length of this section of the link;
- A diversion to the existing PRoW Footpath (reference 'ECL/7/2') (244m to be stopped up) to the east of Parcel 2 to align the PRoW Footpath with the field boundary of Field D19 (new length 274m), resulting in a 12% increase in length of this section of the link;
- A diversion to the existing PRoW Footpath (reference 'SCL/13/2') (323m to be stopped up) to the south of Parcel 1 (between Shrubs Wood and Decoypond Wood) to align the PRoW Footpath with the field boundary of Field B7 (new length 410m), resulting in a 27% increase in length of this section of the link; and
- Diversions to three existing PRoW Footpaths (references 'SCL/13/1', 'SCL/12/2' and a further diversion to 'SCL/13/2') to rationalise them into a single PRoW Footpath providing access between Pond Farm and Calvert Road (new length 1,027m)

6.1.27. **ES Volume 3, Figure 3.10: Existing and Proposed PRoW and Permissive Footpaths [EN010158/APP/6.3.3]** provides a plan showing the existing PRoW network as well as the recreation and amenity improvements. In terms of new permissive paths, this includes:

- A new public route across Parcel 1 by connecting the to-be-rationalised PRoW Footpath (reference 'SCL/13/2') before tracking east to the south of Shrubs Wood, east across Knowl Hill (Field B17) and then tracking north towards Three Points Lane (approximate length 1.9km);
- A new public route across Parcel 1 connecting the above permissive path beginning from the intersection between Fields B17, B20 and B21

which then runs north to the west of B21 and B22 to Calvert Road and onwards to PRoW Footpath (reference 'MCL/13/1') (approximate length 0.7km).

6.1.1. The proposed permissive footpaths would be implemented during the construction phase, and would remain open and accessible to the public during the operation (including maintenance) phase, save for any occasional closures to allow for farming activities to be undertaken safely, and to comply with their status as a permissive path.

6.1.2. The **Outline RoWAS [EN010158/APP/7.8.2]** forms the framework for detailed Rights of Way and Access Strategy Plan(s) which are secured by a Requirement of the Draft DCO and are to be developed by the principal contractor to cover all phases of the Proposed Development. The outline framework submitted with this DCO Application details the principles, management and inspection requirements as well as the extent and nature of any closure, diversion and/or improvement to the PRoW network and permissive footpaths.

Embedded Mitigation for Socio-economic Effects

Embedded Mitigation and Compensation for Effects on Business and Commercial Activity

6.1.3. Commercial agreements (including land swap and compensation) will be in place, which provides mitigation for the potential effects on agricultural and non-agricultural employment and business viability within the Order Limits would be mitigated (or compensated for) through the development of financial compensation and/or land swaps in order to provide continuity for employment and socio-economic activity where practicable.

6.1.4. In all cases at the point of submission of the application, Heads of Terms have been agreed for land swaps and/or compensation with all tenants and landowners, and in some cases, agreements have been finalised.

6.1.5. The Applicant has taken advice from concerned non-agricultural businesses during the Proposed Development's design and statutory consultation phases, and has amended the Proposed Development's design over that period to help to avoid, reduce and/or minimise the potential for noise and accessibility effects perceived by these businesses. In order to limit disruption, the Proposed Development has:

- Removed the option consulted on previously for a substation and/or BESS to be included on Field 23 (which will now be a field of solar panels); thereby reducing maximum operational noise levels/effects and providing more opportunity for corridors for grazing animals to pass through;

- Removed a potential construction compound siting zone from the area between Parcels 2 and 3 to ensure continuity of access by an existing non-agricultural tenant; and
- Confirmed and secured in the **Design Commitments [EN010158/APP/5.9.3]** that at the detailed design stage, the solar panel arrangement for Field E23 will be designed to incorporate movement corridors for sheep and/or horses to cross the field to access their other adjacent grazing fields.

Embedded Mitigation for Public Safety

Embedded Mitigation for Effects on Electromagnetic Fields and Radiation

6.1.6. The majority of underground cabling within the Site to facilitate the connection between the Solar PV modules, Balance of Solar System (BoSS), Satellite Collector Compounds, BESS and Rosefield Substation would be up to 132kV, apart from the section of 400kV underground cabling which would connect the Rosefield Substation to the National Grid East Claydon Substation.

6.1.7. The 400kV underground cabling would be buried within trenches, with each up to 2m in width and approximately 1.5m in depth and would be sited at a distance of approximately 500m from the nearest sensitive receptors. This is designed in accordance with the relevant guidance (DECC Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice 2012) [**Ref. 68**] and secured in the **Design Commitments [EN010158/APP/5.9.3]** .

6.1.8. In accordance with the Technical Advice Page for Scoping Solar Development [**Ref. 69**], a standalone EMF study was undertaken and is presented in **ES Volume 4, Appendix 5.6: EMF Assessment (Electromagnetic Field Assessment) [EN010158/APP/6.4] [APP-084]**.

6.1.9. The study sets out the proposed siting zone for the cabling and includes an assessment of EMF for underground cabling and the Rosefield transformers. The assessment recommended a minimum clearance distance of 25m to human receptors relative to public exposure limits for magnetic and electric fields which has been embedded into the Proposed Development and is secured in the **Works Plans [EN010158/APP/2.3.3]**.

Embedded Mitigation for Effects on Major Accidents and Disasters (Battery Failure, Fire)

6.1.10. Relevant mitigation measures are secured within the **Outline CEMP [EN010158/APP/7.2.2]**, **Outline OEMP**

[EN010158/APP/7.3.2] and **Outline BSMP [EN010158/APP/7.9.2]** which have been submitted in support of the DCO Application.

6.1.11. The Applicant has included an **Outline BSMP [EN010158/APP/7.9.2]** within the DCO Application, which sets out the key fire safety provisions for the Battery Energy Storage System (BESS) proposed to be installed at the Proposed Development including measures to reduce fire risk and fire protection measures. This Plan has three important implications in terms of health pathways:

- Ensuring that there is visibility and oversight of health and safety measures in collaboration with stakeholders with an interest or statutory responsibility for public health (such as the UK Health Security Agency (UKHSA) and Buckinghamshire Fire Authority);
- Providing security for the delivery of detailed plans and measures to reduce the risk of fire and other potential effects related to BESS on physical health and wellbeing; and
- Providing clarity and reassurance of the safety and security of design decisions (such as location and layout of the BESS), procedures (e.g. procurement, monitoring and testing) and elements (such as access arrangements for emergency vehicles) of the Proposed Development which, through consultation and engagement, are considered to raise anxiety and stress in the community, thereby helping to address concerns relating to mental health and wellbeing.

6.1.12. Section 3 of the **Outline BSMP [EN010158/APP/7.9.2]** (as well as the **Consultation Report [EN010158/APP/5.1] [APP-020]**) sets out how the Proposed Development has evolved through consultation feedback from local consultees (including parish councils).

6.1.13. The **Outline BSMP [EN010158/APP/7.9.2]** demonstrates that as well as the Applicant having significant internal expertise and robust processes in BESS development, the relevant stakeholders have been consulted and their responses have informed the design of the Proposed Development, and therefore safety would be inherent in the overall design, minimising the risk of a fire event occurring, and reducing the impact of such an event should it occur.

6.1.14. The **Outline BSMP [EN010158/APP/7.9.2]** provides a clear list of pre-construction information requirements (Section 5) to enable the Applicant to demonstrate prior to construction that the Proposed Development would be implemented and operated safely.

Embedded Mitigation for Effects on Land and Water Contamination

6.1.15. Embedded mitigation will be in place to reduce the risk of adverse health effects, and this will be secured by the **Design Commitments [EN010158/APP/5.9.3]** and the **Outline Drainage Strategy [EN010158/APP/7.11.2]**.

6.1.16. Proposals include various embedded mitigation measures in order to successfully integrate the Proposed Development within the context of the existing landscape and the water environment, while preventing adverse effects on ecological features. These measures include:

- Perimeter fencing surrounding the Solar PV development would be offset by at least 10m either side from all existing ditches (where crossings are not required) to provide a buffer for any buffer entrained surface water runoff, as secured within the **Design Commitments [EN010158/APP/5.9.3]**;
- An **Outline Drainage Strategy [EN010158/APP/7.11.2]** which includes design measures for SuDS features and details the principles for ensuring firewater runoff is retained within BESS compound;
- Vegetation management to ensure kinetic energy from rainfall run off is dispersed to reduce the risk of soil erosion as outlined in the **Outline LEMP [EN010158/APP/7.6.2]**; and
- Construction compounds being at least 10m from watercourses as secured in the **Works Plans [EN010158/APP/2.3.3]**.

6.1.17. Relevant mitigation measures are secured within the following documents which are submitted in support of the Development Consent Order Application:

- **Outline CEMP [EN010158/APP/7.2.2]**;
- **Outline OEMP [EN010158/APP/7.3.2]**;
- **Outline DEMP [EN010158/APP/7.4.2]**; and
- **Outline Drainage Strategy [EN010158/APP/7.11.2]**.

Good/Best Practice Measures for General Construction Effects

6.1.18. The Applicant is committed to minimising impacts from construction on local residents – in many cases, additional mitigation is related to addressing **general or in-combination effects** relating to environmental change, or the general effects of construction activity which may not be directly attributable to specific environmental factors.

6.1.19. These measures have been developed to address concern related to effects on the perception of change and the related stress and anxiety of such change, having the effect of helping to provide agency to the

community, and information about the Proposed Development, as well as involvement in the Proposed Development and demonstrating accountability and the means to rectify any issues that the community may raise.

6.1.20. Mitigation measures as set out in the relevant control documents, primarily (for construction) the **Outline CEMP [EN010158/APP/7.2.2]**, have been provided in response to the assessed likely impacts. These include:

- Committing that normal working hours will be between 7am to 7pm from Mondays to Fridays, and 7am to 12pm on Saturdays.
  - No works will take place on Sundays or Public Holidays without prior agreement with Local Planning Authority as the host Local Planning Authority.
  - Working days would consist of one 12-hour shift, with employees travelling to and from Site an hour on either side of these times (i.e. between 6am - 7am and 7pm - 8pm).
- Where onsite works are to be conducted outside the core working hours, they will comply with the restrictions pursuant to the DCO consenting process.
- Between 07:00 - 08:00 and 18:00 - 19:00 Monday to Friday and 07:00 – 08:00 on Saturdays, noisier activities (such as piling) would be restricted depending on the construction activity proposed to take place and its proximity to sensitive receptors.
- Activities such as trenchless/Horizontal Directional Drilling and Abnormal Indivisible Load (AIL) deliveries would be agreed upon with the relevant planning authority prior to these works.
- A Principal Contractor will be appointed to manage site security and any environmental risks that could arise during construction works, while site security fencing is set to remain in place throughout the duration of the construction period.
- Any storage of materials will be kept secure to prevent theft or vandalism while a safe storage system for accessing the materials storage areas would be implemented by the Principal Contractor.
- Construction temporary site lighting (in the form of mobile lighting tower) will be utilised where natural lighting is unable to meet sheltered and confined areas, in order to maintain sufficient security and health and safety for the Order Limits.
- Adopting The Considerate Constructors Scheme (CCS) to assist in reducing pollution and nuisance from the Scheme, by employing good practice measures which go beyond statutory compliance.

- An Emergency Preparedness and Response Plan will be developed in consultation with the relevant local authority emergency planning officer, emergency services including the local fire service, as well as the Environmental Agency in relation to responding to flood warnings and events, detailing the procedures for responding to incidents and emergencies.
- Engagement with utilities companies prior to commencement of construction activities to identify utilities and agree safe methods of working around existing utilities.
- Ensuring that where on-site works need to be conducted outside of core working hours, restrictions are agreed with relevant planning authorities and complied with.
- Measures to control and mitigate against dust tracking onto the highway (including vehicle wheel cleaning) will be implemented by the Principal Contractor, while a road sweeper will be deployed when required to remove mud and dust on the highway.
- The Site will be prepared well, with specific measures of this preparation process including localised site levelling, vegetation clearance, landscape planting, an establishment of perimeter fencing and other security measures.

7. Assessment of Health Effects

7.1. Changes in Air Quality

Effects during the Construction and Decommissioning Phases

7.1.1. The assessment at **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** suggests that prior to additional mitigation, human health impacts from dust and particulate emissions generated from activities at the Proposed Development would be **low risk (not significant)** for earthworks, construction/decommissioning and trackout activities, and **negligible risk (not significant)** for demolition (during decommissioning phase) activities.

7.1.2. The temporary nature and low level of air pollution at the site, combined with embedded mitigation including setback distances from receptors as included within the **Design Commitments [EN010158/APP/5.9.3]** means it is unlikely there would be a risk of emissions (either in isolation or combination) that could result in an exceedance of Air Quality Standards, with the **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** suggesting that there would be no exceedances of Air Quality Standards, and therefore **no significant effect** on health receptors, noting that sensitivity of the area to human health impact is identified as **low**.

7.1.3. In terms of construction and decommissioning traffic-related air quality effects, the annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Site are expected to be well below the Air Quality Standards, suggesting that there would be no exceedances of Air Quality Standards, and therefore **no significant effect** on health receptors, despite their **high** sensitivity.

Effects during the Operational (including maintenance) Phase

7.1.4. Due to the nature of the Proposed Development, the principal operational (including maintenance) phase effect on air quality is likely to be associated with traffic emissions as a result of any changes in traffic flows or flow composition the Proposed Development may bring.

7.1.5. The assessment at **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** suggests that the Proposed Development is not expected to generate traffic exceeding Environmental Protection UK and Institute of Air Quality Management guidance screening criteria once operational. Therefore, the potential effects from road exhaust emissions during operation would **not be significant** for human receptors in this regard, despite their **high** sensitivity.

Additional Mitigation

7.1.6. Notwithstanding the conclusions of a non-significant effect during the construction, decommissioning and operational (including maintenance) phases, it is recognised that air quality is a fundamental concern of the local community which may cause stress and anxiety, reducing mental health and wellbeing for some individuals and sub-populations.

7.1.7. As a result, additional mitigation for the protection of health and wellbeing has been recommended in the form of management plans, and commitments to the provision of information, engagement and liaison with communities to ensure visibility of effects including monitoring and regular feedback and interaction with the Applicant and Contractor during the construction phase.

7.1.8. Additional mitigation has been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level. For air quality, these include:

- Appropriate, site-specific mitigation measures for management of dust and particulates, both in terms of general measures and measures specific to demolition, earthworks, construction and trackout and management of road traffic exhaust emissions, in accordance with Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction. These are listed in identified in Table 6.16 of **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** and secured within the **Outline CEMP [EN010158/APP/7.2.2]**, the **Outline CTMP [EN010158/APP/7.5.2]** and the **Outline DEMP [EN010158/APP/7.4.2]**.
- Management of emissions from non-road mobile machinery by ensuring that any plant used on-site comply with the nitrogen oxides, particulate matter and carbon monoxide emissions standards specified in the Regulation (EU) 2016/1628 of the European Parliament and of the Council (as amended) as a minimum, where they have net power of between 37kW and 560kW. The emission controls are outlined and secured within the **Outline CEMP [EN010158/APP/7.2.2]** and the **Outline DEMP [EN010158/APP/7.4.2]**.
- Best practice mitigation measures (described in Table 6.16 of **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]**) to further reduce any residual effects on air quality during the operational phase, secured via the **Outline OEMP [EN010158/APP/7.3.2]**.

Assessment of Residual Health Effects

7.1.9. When adopting mitigation measures (outlined in the **Outline CEMP [EN010158/APP/7.2.2]** and **Outline DEMP [EN010158/APP/7.4.2]**), **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]** suggests that there would be a **negligible risk** for all activities for construction and decommissioning phases, resulting in the residual effect on human health being **not significant** in the context of legal standards and thresholds across all receptor types and locations assessed.

7.1.10. Embedded measures have been secured in-line with standards, guidance and thresholds within which the consideration of physical health is an inherent consideration (for example in setting following Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction **[Ref. 67]** for the risk of health effects due to an increase in exposure to PM_{10}).

7.1.11. When adopting best practice mitigation measures (described in Table 6.16 of **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]**) to further reduce any residual effects on air quality during the operational phase, secured via the **Outline OEMP [EN010158/APP/7.3.2]**, **ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2] [APP-049]**) concludes that the residual effects on human health are **not significant** in the context of legal standards and thresholds across all receptor types and locations assessed.

7.1.12. In addition, following iterative preliminary assessment, a suite of additional mitigation has also been secured that aims to address the potential for both physical and mental health effects to occur, through a combination of 'plan-monitor-manage' measures. This includes monitoring and the delivery of remedial actions, an approach to community engagement, feedback and scrutiny.

7.1.13. In terms of the wider determinants of health, and through the application of health-specific assessment criteria in the context of the prevailing sensitivity of the sub-populations within which air quality receptors have been identified, it is considered that the **sensitivity** of the population to changes in air quality is considered to be **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them are very low;
- There is a reliance on shared resources that may be affected by construction activity and changes in air quality (though this is limited to PRoW and accessible natural environment, and there are alternatives to resources that are most likely to be affected);

- People generally have a limited capacity to adapt to changes in air quality, but may seek to avoid areas where the limited changes in air quality may occur;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects on air quality are fair to good.

7.1.14. There are some sub-populations that are likely to be more sensitive – as set out in **Section 5**, rates of respiratory disease may be slightly higher than national average for some local sub-populations, resulting in potentially greater prevailing health inequality for those sub-populations. Older people may also be more sensitive to change with regard to air quality, whereby limited mobility and greater dependency may result in a limited capacity to adapt to change. As such, for older sub-populations and sub-populations with prevailing respiratory health conditions, sensitivity is likely to be higher.

7.1.15. During the construction and decommissioning phases the **magnitude** of change is considered **small** due to:

- The duration of effects being short-term, albeit with frequent events; but
- Very low or small scale exposure to changes, a small minority of the population affected, and immediate reversal on completion of the construction phase;
- Severity predominantly related to minor change in morbidity (physical or mental health) or minor change in quality of life; and
- No service quality implications.

7.1.16. During the operational (including maintenance) phase, the **magnitude** of change is considered **small** due to:

- The duration of effects being long-term but with only occasional events (relating to intermittent and low level operational maintenance and traffic activity); and
- a negligible/small scale exposure to changes, with very few people affected; with
- Severity predominantly related to no change in morbidity (physical or mental health) and minor change in quality of life; and
- No service quality implications.

7.1.17. Overall, the **significance** of the effect of air quality as a determinant on health is also influenced by the approach to and articulation of embedded and additional mitigation set out within this report, along with:

- The inherent consideration of health as a factor in setting air quality thresholds, for example in setting following Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction **[Ref. 67]** for the risk of health effects due to an increase in exposure to PM_{10};
- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

7.1.18. Based on these considerations, in consideration of the prevailing health indicators and taking into account the embedded and additional mitigation measures to be secured, the significance of the effect of air quality as a determinant on physical and mental health and wellbeing is considered to be:

- **Negligible** to **minor adverse** and **not significant** during the construction and decommissioning phases; and
- **Negligible** to **minor adverse** and **not significant** during the operational (including maintenance) phase.

7.2. Changes in Noise and Vibration

Effects during the Construction and Decommissioning Phases

7.2.1. The assessment at **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** identifies that before additional mitigation, noise from construction and decommissioning has the potential to result in **significant adverse** effects, but vibration and increased traffic noise would not.

7.2.2. However, in terms of noise effects from construction and decommissioning activity at the Site, **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** reports that in most cases, given the scale of the Site and the separation distances to surrounding receptors, it is expected that the majority of the construction works could be undertaken without

causing an exceedance of the daytime 65 dB $L_{Aeq,T}$ threshold criterion, before additional mitigation, and therefore would be **not significant**.

7.2.3. In one location there would be exceedances – for noise receptor R24 (Blackmore Hill Farm Cottages). However, works giving rise to these exceedances are noted to be transitory in nature and would therefore only occur for a limited period of time, during working hours.

7.2.4. It is noted that construction noise may change the experience of users of PRoW across and adjacent to the construction works. **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** reports that:

- It could be expected that users of PRoW within or adjacent to the Order Limits may be subject to construction noise levels which exceed the typical pre-construction ambient noise levels.
- However, the construction activities affecting an individual route would often be localised, and the transitory nature of PRoW users would mean that they are not exposed to construction noise for an extended period.

7.2.5. Road traffic noise is also considered in **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** as a result of additional construction traffic in and around the Site. While in some cases the noise levels would increase, the effects aren't considered to be significant within **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]**.

Effects during the Operational (including maintenance) Phase

7.2.6. **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** suggests that noise arising from the operation of Inverters, Transformers, HVAC, and other ancillary electrical infrastructure required for the Solar PV development/BESS infrastructure has the potential to impact sensitive receptors surrounding the Site.

7.2.7. Operational noise, by source, is described in **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]**, at Table 13.8, with the assessment of that noise on receptors set out in Table 13.18.

7.2.8. During the operational (including maintenance) phase, **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** reports that no sensitive receptor would experience daytime lowest observed adverse effect level (LOAEL) exceedances as a result of noise associated with the Proposed Development.

7.2.9. Planning Practice Guidance [**Ref. 70**] determines this level as when noise can be heard, but does not cause any change in behaviour, attitude or

other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

7.2.10. The noise levels without additional mitigation are predicted to exceed the LOAEL design thresholds at the following sensitive receptors at night time:

- R2 – Bernwood Farm;
- R7 – Catherine Cottages;
- R12 – Hogshaw Farm;
- R18 – Sion Hill Farm;
- R20 – Borshaw Farm; and
- R24 – Blackmore Hill Farm Cottages.

7.2.11. As such, without additional mitigation, there would be the potential for noise to translate into **significant adverse** effects on health and wellbeing for some receptors in some locations, during some times of the day – this could result in both physical and mental health pathways being affected, if not addressed through additional mitigation.

Additional Mitigation

7.2.12. It is recognised that noise is a fundamental concern of the local community that may contribute to a real or perceived effect on residential amenity or the enjoyment of the outdoor environment, which may cause stress and anxiety, reducing mental health and wellbeing for some individuals and sub-populations.

7.2.13. As a result, additional mitigation for the protection of health and wellbeing has been recommended in the form of management plans, and commitments to the provision of information, engagement and liaison with communities to ensure visibility of effects including monitoring and regular feedback and interaction with the Applicant and Contractor during the construction phase.

7.2.14. Additional mitigation has been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level. For noise, these include the following measures to be implemented during the construction and decommissioning phases:

- The implementation of ‘Best Practicable Means’ as defined by the Control of Pollution Act 1974 [**Ref. 71**], which would serve to minimise the potential noise and vibration impacts at receptors in the vicinity of the construction works, secured by the

Outline CEMP [EN010158/APP/7.2.2], **Outline OEMP [EN010158/APP/7.3.2]** and **Outline DEMP [EN010158/APP/7.4.2]**;

- A number of measures that may be employed where reasonably practicable to mitigate the noise level impact from the construction and decommissioning phases secured in the **Outline CEMP [EN010158/APP/7.2.2]**:
  - Temporary noise barriers close to noise-producing plant to minimise construction induced noise levels, where there is potential for the construction works to give rise to medium or high impact magnitudes at noise sensitive receptors;
  - Where practicable, temporary enclosures will be used to screen all static or semi-static plant from noise sensitive receptor locations;
  - All engine compartments or acoustic enclosures are closed whilst engines are running;
  - Minimising drop heights of materials i.e. carefully depositing materials;
  - Avoiding vehicle movements over irregular surfaces (which tends to create more noise/vibration emissions);
  - At all times, workers' shouting or raised voices to be kept to a minimum;
  - All plant, equipment and noise control measures applied to plant and equipment to be maintained in good and efficient working order and operated such that noise emissions are minimised as far as reasonably practicable.
  - Any plant, equipment or items fitted with noise control equipment found to be defective will not be operated until repaired;
  - Machines in intermittent use to be shut down or throttled down to a minimum during periods between works;
  - A quiet working ethic will be employed to ensure that all members of the workforce have consideration for the nearby residents;
  - Prohibit sounding of vehicle horns to gain access to the Primary and Secondary Construction Compounds;
  - The delivery routes set out in the **Outline CTMP [EN010158/APP/7.5.2]** will be communicated to and adhered to by all suppliers;
  - Design the Primary Construction Compound and Secondary Construction Compound layouts to reduce the need for reversing vehicles and ensure that drivers are familiar with the worksite layout;

- Utilise reversing alarms incorporating one or more of the features listed below (or other comparable system):
  - Highly directional sounders;
  - Use of broadband sounders;
  - Self-adjusting output sounders;
  - Flashing warning lights; and
  - Reversing alarms that are set to the minimum output noise level required for health and safety compliance.
- Toolbox talks carried out by the principal contractor to ensure that all members of the workforce are aware of potential noise impacts on the sensitive receptors in the surrounding area.

7.2.15. During the operational (including maintenance) phase, in the case of the main transformers being a major component of the acoustic emissions from the Proposed Development, it is proposed that a minimum 5 dB(A) reduction is obtained at source through refinement of the engineering requirements in order to adopt lower noise emitting transformers. This will be secured through the **Outline OEMP [EN010158/APP/7.3.2]**.

7.2.16. In addition, several barriers will be in place during operation to limit noise, secured through the **Outline OEMP [EN010158/APP/7.3.2]**:

- 3.5m high barrier around the BESS container areas;
- 5m high barrier around sections of the boundary of the Rosefield Substation;
- 3.5m high absorptive barriers around Central Inverters that are impacting upon noise-sensitive receptors; and
- Introduction of enclosures and/or barriers around the main transformers within the Rosefield Substation and Satellite Collector Compound.

7.2.17. Following concern raised by Buckinghamshire Council and members of the community relating to the monitoring and communication of noise impacts, at Deadline 1 the Applicant has revised the **Outline OEMP [EN010158/APP/7.3.2]** to add commitments to monitoring and reporting. While operational noise is not considered to be likely to be significant, this commitment is important in health terms to demonstrate and provide accountability for the potential or perception of effects. In summary these commitments to monitoring include:

- Noise measurements of the installed operational equipment will be undertaken to verify that noise levels at source align with values used within the noise prediction model prepared at the detailed design stage.

- The noise monitoring process would be undertaken on a cyclic basis at an interval agreed with the Environmental Health department at Buckinghamshire Council.
- The resultant dataset would be used to verify that the noise emissions have not increased over time, at a magnitude that could result in significant adverse effects.
- If the noise monitoring demonstrates that the source levels are higher than those used to inform the noise prediction model, an appropriate mitigation strategy will be developed to ensure that the resultant noise levels do not exceed the adopted criteria of 40 dB L_{Ar} daytime and 35 dB L_{Ar} night-time at high sensitivity receptors, as secured by a Requirement in Schedule 2 of the **Draft DCO [EN010158/APP/3.1.3]**.

7.2.18. The revised **Outline OEMP [EN010158/APP/7.3.2]** also includes commitments to ensure a clear, transparent and effective complaints procedure for noise effects. In the event of a noise related complaint being received during the operational (including maintenance) phase, the following procedure would typically be adopted:

- Community Liaison Officer to log noise complaint and advise complainant on the steps that will be taken, and to notify the Environmental Health department at Buckinghamshire Council.
- Representative of the Applicant will carry out an inspection of noise emitting equipment in the locality of the complainant property.
- Complete remedial works if necessary and validate the effectiveness of these works – if the source levels remain higher than those used to inform the noise prediction model, an appropriate mitigation strategy will be developed to ensure that the resultant noise levels do not exceed the adopted criteria of 40 dB L_{Ar} daytime and 35 dB L_{Ar} night-time at high sensitivity receptors, as secured by a Requirement in Schedule 2 of the **Draft DCO [EN010158/APP/3.1.3].**
- Communicate details of the noise complaint and the remedial actions that have been taken.

Assessment of Residual Health Effects

7.2.19. Following the implementation of suitable additional mitigation measures, **ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]** reports a direct, temporary **minor adverse** effect, which is considered to be **not significant** in the context of legal standards and thresholds across all receptor types and locations assessed during the construction and decommissioning phases.

7.2.20. Following the application of additional mitigation measures during the operational (including maintenance) phase, the predicted operation (including maintenance) phase noise levels throughout daytime and night-time periods would not exceed 35 dB $L_{Ar,T}$ at any receptors[8].

7.2.21. Noise levels of this magnitude are considered to successfully comply with the LOAEL criteria within Planning Practice Guidance – Noise **[Ref. 70]**, resulting in a direct, permanent **minor adverse** effect reported in **ES ES Volume 2, Chapter 13: Noise and Vibration [EN010158/APP/6.2.2]**, which is considered **not significant.**

7.2.22. It is important to acknowledge that effects on physical health (and pathways for mental health effects to manifest as physical health effects) are an inherent consideration of health as a factor in setting community noise thresholds, as determined by WHO guidelines and the definition of community noise.

7.2.23. However, effects below the threshold may be significant where there is the potential for noise to occur without the ability for a community to access information about the source and scale of the noise – as such, clear communication and a commitment to monitoring and the articulation of monitoring is considered essential to avoid adverse effects on health and wellbeing, and this has been factored into management plans following engagement with Environmental Health Officers at Buckinghamshire Council.

7.2.24. In terms of the wider determinants of health, and through the application of health-specific assessment criteria set out earlier in this Report, in the context of the prevailing sensitivity of the sub-populations within which noise receptors have been identified, it is considered that the **sensitivity** of the receptor is **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them are very low;
- There is a reliance on shared resources that may be affected by construction activity and changes in the noise environment (though this is limited to PRoW and accessible natural environment, and there are alternatives to resources that are most likely to be affected);
- People generally have a limited capacity to adapt to changes in noise and experience of noise may be subjective;

[8] This is the lowest observed adverse effect level (LOAEL) exceedances as a result of noise associated with the Proposed Development. Planning Practice Guidance determines this level as when noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects on noise are fair to good.

7.2.25. There are some sub-populations that are likely to be more sensitive – as set out in **Section 5**, rates of multimorbidity and cardiometabolic disease may be slightly higher than national average for some local sub-populations (mainly driven by the prevalence of an older population), resulting in potentially greater prevailing health inequality for those sub-populations. Older people may also be more sensitive to change with regard to noise, whereby limited mobility and greater dependency may result in a limited capacity to adapt to change.

7.2.26. During the construction and decommissioning phases, the **magnitude** of change is considered **small** to **medium** due to:

- The duration of effects being short-term, albeit with frequent events; but
- Very low or small scale exposure to changes, a small minority of the population affected, and immediate reversal on completion of the construction phase;
- Severity predominantly related to minor change in morbidity (physical or mental health) or minor change in quality of life; and
- No service quality implications.

7.2.27. During the operational (including maintenance) phases, the **magnitude** of change is considered **small** due to:

- The duration of effects being long-term; but
- a negligible or very low / small scale exposure to changes, very few people affected; with
- Severity predominantly related to no change in morbidity (physical or mental health) and minor change in quality of life; and
- No service quality implications.

7.2.28. Overall, the significance of the effect of noise as a determinant on health is also influenced by the approach to and communication of embedded mitigation set out within this report, along with:

- The inherent consideration of health as a factor in setting community noise thresholds, as determined by WHO guidelines [**Ref. 72**] and the definition of LOAEL adopted in Planning Practice Guidance [**Ref. 70**];

- Change, due to the Proposed Development, being well within appropriate regulatory thresholds or statutory standards;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the Proposed Development and changes to health outcomes; and
- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

7.2.29. Based on these considerations, in consideration of the prevailing health indicators and the approach to embedded and additional mitigation, the significance of the effect of noise as a determinant on physical and mental health and wellbeing is considered to be:

- **Minor adverse** and **not significant** during the construction and decommissioning phases; and
- **Minor adverse** and **not significant** during the operational (including maintenance) phase; and

7.3. Changes in the Landscape and Visual Environment

7.3.1. While visual amenity is not itself a direct 'wider determinant of health', it can contribute towards other determinants and influence behaviour of people and sub-populations, particularly where there is a high sensitivity to change or a prevailing high quality environment that is fundamental to recreational activity.

7.3.2. **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** presents an assessment of likely significant effects arising from construction, operation and decommissioning of the Proposed Development on landscape and visual amenity.

Effects during the Construction and Decommissioning Phases

7.3.3. When looking at effects on visual amenity, **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** therefore reports **significant major** or **moderate** adverse visual effects during the construction and decommissioning phases at the following receptors likely to be accessed by people for recreational purposes, taking into account all mitigation proposed:

- Six groups of PRoW (including North Buckinghamshire Way/Midshires Way, Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere

Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3) representing 30 PRoW; and

- Hogshaw Farm and Wildlife Park.

7.3.4. All other visual amenity effects on sensitive receptors were recorded to be **moderate/minor** adverse or **minor/negligible** adverse (**not significant**) – this includes **non-significant effects** (**negligible** or **minor/minor to moderate adverse**) for seven PRoWs (including NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring).

7.3.5. Effects related to landscape and visual amenity are reported as **moderate/minor adverse (not significant)** in terms of a varied visual experience of construction and decommissioning activity from the public footpath (PRoW MCL/10/2) and parkland at Viewpoint 5 that reflects the receptor group for Claydon House, identified as an important cultural receptor in its setting.

7.3.6. However, it is noted that for Claydon House, effects related to cultural heritage which draw upon the effects of visual amenity on setting for cultural heritage are reported as **slight adverse (not significant)** in terms of construction and decommissioning activity in the setting of Claydon House and Claydon Grade II Registered Park and Garden.

Effects during the Operational (including maintenance) Phase

7.3.7. During the operational (including maintenance) phase, **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** reports the potential for **significant major** or **moderate** adverse operational effects were recorded within the assessment on the following receptors:

- LCA 5.7: Hogshaw Claylands (moderate adverse);
- LCA 7.3: Claydon Bowl (moderate adverse);
- LCA 9.1: Finemere Hill (major/moderate adverse);
- Five PRoW (including Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3);
- Claydon House (moderate adverse); and
- Hogshaw Farm and Wildlife Park (moderate adverse).

7.3.8. There were also a number of other **minor** and **moderate** adverse effects on receptors that were deemed to be **not significant**, while a moderate beneficial (significant) effect was identified on the landscape fabric during the tenth year of operation.

7.3.9. **Non-significant** visual effects (**negligible** or **minor/minor to moderate adverse**) will occur for eight PRoWs (including North Buckinghamshire Way/Midshires Way, NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring).

7.3.10. It is noted that effects related to cultural heritage (which draw on visual amenity in terms of effects on setting for cultural heritage) are reported as **slight adverse (not significant)** in terms of operational (including maintenance) activity in the setting of Claydon House and Claydon Grade II Registered Park and Garden.

7.3.11. **ES Volume 4, Appendix 10.5: Residential Visual Amenity Assessment [EN010158/APP/6.4] [APP-114]** assesses potential effects on residential properties specifically, which are summarised in **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]**.

7.3.12. **ES Volume 4, Appendix 10.5: Residential Visual Amenity Assessment [EN010158/APP/6.4] [APP-114]** suggests that residents of 4-5 Catherine Cottages and 6-7 Catherine Cottages would experience significant visual effects during year 1. Due to the establishment of mitigation, these effects would reduce in magnitude by year 10 and would not be significant. Only residents of dwellings at Bernwood Farm and Sion Hill Farm would experience significant visual effects during both years 1 and 10 of operation.

7.3.13. The assessment concludes that the Proposed Development would not have an overbearing effect on the visual amenity experienced by residents of properties around the Proposed Development.

Additional Mitigation

7.3.14. It is noted that for landscape and visual effects, mitigation is embedded in the form of planting and landscape strategy, but additional mitigation in the form of the long-term maintenance of such embedded mitigation is required to ensure its effectiveness.

7.3.15. Feedback from the community has identified that the experience of the natural environment is a key factor contributing to mental health and

wellbeing, and therefore some people and sub-populations – particularly those that are more likely to access recreational receptors – may experience pronounced changes in mental health and wellbeing in some locations, on a subjective level, as a result of these effects.

7.3.16. As a result, embedded and additional measures have therefore been included which seek to offset the potential for effects on experience of the natural environment, for example through the provision of new permissive paths and information/signage that offer alternative recreational routes, and through the ability to interact with the Project via on-going community engagement.

7.3.17. Additional mitigation has been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level, where practicable. For landscape and visual effects, these include:

- The **Outline CEMP [EN010158/APP/7.2.2]** which will:
  - ensure that construction is undertaken in a sensitive manner with regard to the existing landscape fabric within the Site;
  - ensure that all existing hedgerows, trees and woodland would be retained and protected during construction (except where removal is indicated on the vegetation removal plans shown in **Appendix 3: Vegetation Removal Parameters** to the **Outline LEMP [EN010158/APP/7.6.2]**); and
  - ensure that construction compounds maintain a neat and tidy appearance and that any temporary construction lighting is operated in accordance with an agreed scheme.
- The **Outline CTMP [EN010158/APP/7.5.2]** which will ensure that construction vehicle movements would be routed in accordance with the strategy agreed with Buckinghamshire Council and avoid landscape and visual effects on additional receptors; and
- The **Outline LEMP [EN010158/APP/7.6.2]** which will:
  - establish the principles for maintenance of existing and newly established habitats and planting;
  - ensure, amongst other things, that any defective planting is replaced during the establishment period;
  - ensure that all new planting establishes successfully by Year 10; and
  - ensure that existing and new hedgerows (once established) will be maintained at a minimum height of 3.5m for the duration of the operation phase of the Proposed Development.

7.3.18. There is a strong evidence base in the scientific literature for a causal relationship between physical activity and good physical and mental health, driven by access and appreciation of the natural environment.

7.3.19. The **Outline LEMP [EN010158/APP/7.6.2]** and **Outline RoWaS [EN010158/APP/7.8.2]** secures important enhancement measures relevant to positive health pathways, including the provision of new permissive footpaths and increased accessibility, opportunities for recreation in the natural environment, and environmental improvements.

7.3.20. The Applicant will provide a variety of biodiversity benefits including: new habitat for invertebrates, reptiles, amphibians, small mammals and birds; the sowing of grassland open fields; scrub and margins with wildflower; the planting of hedgerows and tree belts; the establishment of ecological ponds (either former ponds for recreation or new ponds as blue infrastructure works) and wider vegetated cover for foraging and dispersal, to maintain bat flight lines across the landscape, and provide a winter seed source for birds. Further detail of these benefits are captured and secured within the **Outline LEMP [EN010158/APP/7.6.2]**. The Proposed Development would deliver a Biodiversity Net Gain (BNG) in excess of 10%, as secured within the **Outline LEMP [EN010158/APP/7.6.2]**.

7.3.21. As such, the Applicant has sought to secure enhancements to community connectivity, accessibility, the natural environment and recreation within the Application.

Assessment of Residual Health Effects

7.3.22. During the construction and decommissioning phases, following the implementation of embedded and additional mitigation, there are likely to be a mix of **significant** and **non-significant** effects on landscape and visual amenity, which are likely to translate into the potential for effects on physical and mental health and wellbeing, in some instances, and in the context that such pathways are often individual and subjective.

7.3.23. In terms of the wider determinants of health, and through the application of health-specific assessment criteria set out earlier in this Report, in the context of the prevailing sensitivity of the sub-populations within which landscape and visual amenity receptors have been identified, it is considered that the **sensitivity** of the population is **medium** to **high** recognising that:

- Deprivation within directly affected communities and the sub-populations within them are very low;
- There is a reliance on shared resources that may be affected by construction and decommissioning activity and changes in the

landscape and visual environment (though this is limited to PRoW and accessible natural environment, and there are alternatives to resources that are most likely to be affected – including new permissive paths that would be available during the operational (including maintenance) phase);

- People generally have a limited capacity to adapt to changes in landscape and visual environment and experience may be subjective;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for landscape and visual effects are fair to good.

7.3.24. There are some sub-populations that are likely to be more sensitive – as set out in **Section 5**, the prevalence of an older population, more likely to be limited in mobility and with greater dependency may result in a limited capacity to adapt to change. Geographical factors may also influence the sensitivity for some sub-populations, including older people, where there is limited alternative to (for example) recreational routes that may be affected.

7.3.25. During the construction and decommissioning phases, the **magnitude** of change is considered **small** to **medium** due to:

- The duration of effects being short- to medium-term with frequent events; but
- with medium scale exposure to changes, a small minority of the population affected, transient nature of effects related to both the receptor and the source, and immediate reversal on completion of the construction phase; with
- Severity predominantly related to minor change in morbidity (physical or mental health) or minor to moderate change in quality of life; and
- No service quality implications.

7.3.26. During the operational (including maintenance) phase, the **magnitude** of change is considered **small** to **medium** due to

- The duration of effects being long-term; but
- with medium (reducing to medium to low) scale exposure to changes, a small minority of the population affected, transient nature of effects related to both the receptor and the source, and immediate reversal on completion of the operational (including maintenance) phase; with

- Severity predominantly related to minor change in morbidity (physical or mental health) or minor to moderate change in quality of life; and
- No service quality implications.

7.3.27. It is noted that effects are subjective and only one contributor towards effects on health and wellbeing, and that:

- The Proposed Development would not have an overbearing effect on the visual amenity experienced by residents of properties;
- Significant visual effects occur on some but not all of the PRoW within and around the Site; and
- Mitigation is secured – both embedded and additional – to address effects where practicable, and this reflects good practice and has been developed iteratively through consultation and engagement. This includes long-term delivery and maintenance of new permissive paths offering an alternative environment for recreation.

7.3.28. In consideration of the significance of health-specific effects, based on the approach as set out through ISEP (formerly IEMA) Guidance [**Refs. 29 and 30**], it is considered that:

- Changes, due to the Proposed Development, are not considered to have an *influential* effect on the ability to deliver current health policy and/or the ability to narrow health inequalities – though it is noted that consultation/engagement themes among stakeholders show consensus on the importance of the effect;
- Change, due to the Proposed Development, would exceed regulatory thresholds, guidance or statutory standards (as have been assessed by **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]** to the effect that there would be some moderate and major adverse effects in some locations; and
- In general, there is the potential for a slight or small change in the health baseline of the population – with some greater than small (i.e. significant) effects, albeit this is subjective and geographically limited to locations and areas experiencing significant effects, and this relates to public views (on receptors where there is an alternative/substitute e.g. PRoW), with no ~~significant~~ overbearing effects on residential properties and their inhabitants.

7.3.29. Based on these considerations, and including the delivery of mitigation, the significance of the effect of landscape and visual amenity as a determinant on health is considered to be (in the context of the application of mitigation and the approach to assessment of significance set out above):

- **Moderate** adverse and potentially **significant** during the construction and decommissioning phases; and
- **Moderate** adverse and potentially **significant** during the operational (including maintenance) phase.

7.3.30. The applicant has undertaken all practicable measures to address this effect, and considers that due to the subjective nature of landscape and visual effects, and the linkage to mental health and wellbeing effect pathways predominantly, it is important to ensure long-term community engagement and maintenance of embedded mitigation through the measures secured within the **Draft DCO [EN010158/APP/3.1.3]** and management plans.

7.4. Changes in Traffic, Transport and Access (including Access to the Natural Environment for Active Recreation)

Effects during the Construction and Decommissioning Phases

7.4.1. Construction traffic may cause changes to accessibility on the local highway network, and this has the potential to affect access or amenity of community and recreational facilities should it cause delays to visitor journey times, changes to access, or pedestrian amenity effects, delay or fear and intimidation on the PRoW network, for example.

7.4.2. This is assessed in **ES Volume 2, Chapter 15: Transport & Access [EN010158/APP/6.2] [APP-058]** – which reports that without additional mitigation, it is considered possible that adverse effects such as severance, driver delay, pedestrian delay, non-motorised amenity, and fear and intimidation may occur on or be experienced by users of Station Road/Dewes Lane, Snake Lane/Fiddlers Field and Granborough Road. However – this is likely due to the relatively low baseline traffic flow on these roads at present.

7.4.3. Effects on community access via PRoW during the construction phase are assessed at **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**.

7.4.4. During the 30-month construction phase, existing PRoWs that interact with the Order Limits would be kept open as far as it is practicable and safe to do so. However, where it is not practicable and safe, some PRoWs may need to be temporarily diverted. Where PRoWs are to be temporarily diverted or closed, the duration of such a diversion/closure in that area would be for a maximum period of 6 months.

7.4.5. The application of embedded mitigation in the form of diversions would limit the potential for significant effects on the ability for people and sub-

populations to access the social networks and community and commercial facilities relied upon and acting as determinants for health and wellbeing.

Effects during the Operational (including Maintenance) Phase

7.4.6. Transport and access issues resulting from the operation of the Proposed Development have been scoped out of the ES due to the low level of traffic generated during the operation (including maintenance) phase as detailed within **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4] [APP-079]** and confirmed within **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4] [APP-080]**.

7.4.7. In light of this, changes to severance, driver delay, non-motorised user amenity and fear & intimidation in terms of the public highway and its users would not be anticipated to affect the factors that contribute to health pathways, including the use of community/recreation facilities and the service that these facilities provide. Users of these facilities would not be deterred from using these facilities by any traffic/transport or access impacts.

7.4.8. As a result, determinants of health relating to traffic levels and severance on the motorised highway, or limitations of social interaction or access to shared resources are not likely to contribute to significant health and wellbeing effects.

7.4.9. Effects on community access via PRoW during the operational phase are assessed at **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**.

7.4.10. During the operational (including maintenance) phase, all temporary PRoW closures related to construction works would be complete, and the Proposed Development will have provided increased accessibility and three recreational permissive paths as shown within **ES Volume 3, Figure 3.10: Existing and Proposed PRoW and Permissive Footpaths [EN010158/APP/6.3.3]**.

7.4.11. At the operation (and maintenance) phase, the diversion of five PRoW will have been completed, with the replacement/diverted PRoW open and accessible.

7.4.12. At the operational phase, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** reports that:

- The diversion of PRoW ECL/7/2, SCL/13/1, SCL/12/2, SCL/13/2 and ECL/4/2) is likely to result in a **slight adverse** effect on these links.

- However, in the case of diverted routes combining SCL/12/2 and SCL/13/2, there is a decrease in journey length which would result in a **neutral** or **slight positive** effect for that link.
- The creation of new permissive paths would also increase community accessibility and recreational opportunities in an area that is currently inaccessible. The routes would improve community connectivity between the existing public highway and community areas such as East Claydon, Middle Claydon and Botolph Claydon in the east and Calvert in the west.
- Overall, therefore on balance there is likely to be a **permanent**, **slight beneficial** effect on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant**.

7.4.13. As a result, before additional mitigation, during the operational phase there is likely to be an overall enhancement of accessibility within and between residential areas and communities and their facilities, which is likely to contribute positively towards the determinants of physical and mental health (notwithstanding effects relating to recreational use of PRoW, which is considered in terms of landscape and visual amenity.

Additional Mitigation

7.4.14. Additional mitigation has been secured, with relevant monitoring, where it has been considered that this is needed to manage the potential for significant adverse effects to a less than significant level. For traffic, transport and access, these include:

- An **Outline CTMP [EN010158/APP/7.5.2]** will provide mitigation in terms of managing the transport and environmental effects on receptors related to construction traffic. This includes measures for “On-Site Access Management Proposals’ to limit disruption to users of PRoW and permissive paths, provide information and correct any damage caused by construction activity, and ensure safety of users. The Detailed Construction Traffic Management Plan will control traffic movements, facilitate community liaison and feedback, detail signage, include road wear and tear requirements and cater for AIL movements; and
- An **Outline RoWaS [EN010158/APP/7.8.2]** provides mitigation in terms of the approach to management and maintenance of existing, diverted and new PRoW and permissive paths during the construction, operation (including maintenance) and decommissioning phases. In particular, the creation of new permissive paths including a permissive path to Knowl Hill, with interpretation measures for Claydon House and Claydon Park and Garden, will mitigate effects (and potentially provide enhancement) relating to community access. The approach will ensure

safe access across the Order Limits for pedestrians, cyclists and equestrians.

7.4.15. Where PRoWs are to be temporarily diverted or closed, the duration of such a diversion/closure in that area would be for a maximum period of 6 months.

7.4.16. The **Outline RoWAS [EN010158/APP/7.8.2]** details this and forms the framework for Detailed Rights of Way and Access Strategy for long-term diversions, which are to be developed by the principal contractor to cover all phases of the Proposed Development.

Assessment of Residual Health Effects

7.4.17. During the construction and decommissioning phases, following the application of additional mitigation:

- The significance of the effects reported **in ES Volume 2, Chapter 15: Transport & Access [EN010158/APP/6.2] [APP-058]** is **minor adverse** and **not significant**, including on PRoW, Bridleway and Path Users; and
- **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** reports that there is likely to be a **slight adverse** residual effect on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant.**

7.4.18. The potential for effects on the motorised highway have been scoped out of the assessment at **ES Volume 2, Chapter 15: Transport & Access [EN010158/APP/6.2] [APP-058]** and are therefore not considered to result in a perceptible change (i.e. **negligible** and **not significant**) to people or sub-populations, or in detrimental effects on the determinants of health and wellbeing.

7.4.19. During the operational phase, improvements to the PRoW network would be in place and temporary construction-related works affecting existing PRoW would have ceased.

7.4.20. In terms of health and wellbeing pathways (including access to the natural environment for active recreation), it is noted that users of PRoW are likely to experience in-combination effects as a result of the experience of multiple types of environmental change. It is recognised that experience of the natural environment through recreational and other use of PRoW is an important aspect contributing to mental and physical health and wellbeing.

7.4.21. Engagement and consultation has confirmed the understanding that members of the community are concerned about the potential for general change in access and environmental amenity of public spaces (PRoW)

during both the construction and operational (including maintenance) phases, which may have the potential to cause people to avoid using PRoW or reduce their enjoyment of those PRoW for recreation, leading to a detriment in terms of physical and mental wellbeing.

7.4.22. Drawing on assessments within the ES, following the consideration of embedded and additional mitigation, during the construction and decommissioning phase, users of PRoW would be likely to experience:

- **Negligible** to **minor adverse** (**not significant**) effects relating to noise and air quality - changes in amenity of PRoW would be limited spatially, and transitory;
- At most **negligible adverse** (**not significant**) effects in terms of severance, non-motorised user amenity and fear and intimidation;
- **Non-significant effects** (**negligible** or **minor/minor to moderate adverse**) for seven PRoWs (including NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring);
- **Significant effects** (**moderate or moderate/major adverse**) for six groups of PRoW (representing 30 PRoW) (including North Buckinghamshire Way/Midshires Way, Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3); and
- **Slight adverse** residual effect on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant**.

7.4.23. During the operational (including maintenance) phase, users of PRoW would be likely to experience:

- **Negligible** to **minor adverse** (not significant) effects relating to noise and air quality;
- **Negligible effects** in terms of severance, non-motorised user amenity and fear and intimidation) (operational (including maintenance) phase were scoped out of the assessment as a result of being unlikely to give rise to greater than **negligible** effects);
- **Non-significant effects** (**negligible** or **minor/minor to moderate adverse**) for eight PRoWs (including North Buckinghamshire Way/Midshires Way, NCN Route No. 51, PRoW between Three Points Lane and Splash Lane, and PRoW between Finemere Hill and

HS2/Claydon Road, PRoW between Steeple Claydon and Calvert Road, PRoW, lanes and roads between East Claydon Road/Parcel 3 and Granborough/Hogshaw Road, Three Points Lane and the PRoW extending to HS2, Swan's Way/Outer Aylesbury Ring);

- **Significant effects** (**moderate or moderate/major adverse**) for five PRoW (including Bernwood Jubilee Way, PRoW between Calvert Road and HS2, PRoW between Botolph Claydon and Runt's Wood, PRoW to Finemere Hill and PRoW, lanes and roads between East Claydon/East Claydon Road and to within Parcel 3); and
- **Slight beneficial** effects on community access (PRoW and Permissive Paths) and their users (WCH), which is considered to be **not significant -** the creation of new permissive paths would also increase community accessibility and recreational opportunities in an area that is currently inaccessible. The routes would improve community connectivity between the existing public highway and community areas such as East Claydon, Middle Claydon and Botolph Claydon in the east and Calvert in the west.

7.4.24. In terms of the wider determinants of health, and through the application of health-specific assessment criteria set out earlier in this Report, in the context of the prevailing sensitivity of the sub-populations within which receptors have been identified, it is considered that the **sensitivity** of the population is **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them are very low;
- There is a reliance on shared resources that may be affected by construction activity and significant effects on the landscape and visual environment, and non-significant effects on noise, air quality and community access (though this is limited to the motorised highway and PRoW, and there are alternatives to resources that are most likely to be affected – including new Permissive Paths provided during the operational phase);
- People generally have a limited capacity to adapt to re significant effects on the landscape and visual environment (which contribute to effects on recreational enjoyment of PRoW) and experience may be subjective;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects are fair to good.

7.4.25. Feedback from local stakeholders has highlighted that the prevalence of an older population, in a rural setting, may result in a sub-population that is more sensitive to changes in traffic and access as a result of greater dependency on support for mobility and community access, and higher rates of chronic or long-term conditions, requiring a reliable and more frequent access to primary and emergency healthcare services.

7.4.26. During the construction and decommissioning phases, the **magnitude** of change is considered **small** due to:

- The duration of effects being short term; but
- a negligible or very low/small-scale exposure to changes, very few people affected - while there would be some short-term closures and disruption, this is limited and well managed and communicated, and is within the context of wider accessibility of routes in the local area and diversions that would be provided by the Applicant; with
- Severity predominantly related to no change in morbidity (physical or mental health) and minor change in quality of life; and
- No service quality implications.

7.4.27. During the operational (including maintenance) phase, the **magnitude** of change is considered **small** due to:

- The duration of effects being long-term; but
- a small-scale exposure to changes, very few people affected; with
- Severity predominantly related to minor change in morbidity (physical or mental health) and minor change in quality of life as a result of additional PRoW/permissive access options;
- there being long-term improvements in accessibility within the local area and across the Site following the end of the construction phase; and
- No service quality implications.

7.4.28. In consideration of the significance of health-specific effects, based on the approach as set out through ISEP (formerly IEMA) Guidance, it is considered that:

- Change, due to the Proposed Development, would be well within appropriate regulatory thresholds or statutory standards and in-line with appropriate guidance and policy which considers thresholds for change in accessibility;
- There being likely to be at most a small change in the health baseline of the population, albeit there is a clear relationship between changes that would result from the project and changes to health outcomes – but that

the potential change in the baseline could be positive as a result of increased access options; and

- Change, due to the Proposed Development, having at most a marginal effect (and likely to have no effect) on the ability to deliver current health policy and/or the ability to narrow health inequalities.

7.4.29. Based on these considerations, following additional mitigation, the significance of the effect of traffic, transport and access as a determinant on health is considered to be:

- **Minor adverse** and **not significant** during the construction and decommissioning phases; and
- **Minor adverse** and **not significant** during the operational (including maintenance) phases – with the potential for some **minor beneficial** and **not significant** effects linked to improved connectivity and new recreational permissive paths.

7.5. Changes in the Socio-economic Environment

Effects on (Existing) Local Business, Jobs and Commercial Activity (Construction and Decommissioning Phases; and Operational (including maintenance) Phase)

7.5.1. During the construction and decommissioning phases, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** reports that over a phased period, all of the agricultural land within the fields identified for accommodating long-term activity under **Works Nos 1, 2, 3, 4, 5 and 8** (see the **Works Plans [EN010158/APP/2.3.3]**) would be taken out of agricultural use, and this would be for the duration of the construction and operational phases.

7.5.2. This represents a temporary (construction, operation (including maintenance) and decommissioning phase) long-term change in agricultural capacity.

7.5.3. Cabling and other supporting activity will also be undertaken in areas under **Works No. 6 and 7**, this represents a temporary (construction only) short-term change in agricultural capacity.

7.5.4. **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** reports that:

- during the temporary 30-month construction phase (and similar decommissioning phase) the Proposed Development would result in agricultural land being taken out of agricultural use – equivalent to around 0.65% of agricultural land in Buckinghamshire, resulting in the

indicative short-term reduction of the indicative capacity for up to around 5 FTE jobs; and

- During the operational (including maintenance) phase, the Proposed Development would result in agricultural land being taken out of agricultural use, amounting to up to 0.43% of agricultural land in Buckinghamshire, resulting in the indicative long-term reduction of the indicative capacity for up to around 10 FTE jobs.

7.5.5. Engagement with the agricultural operators has confirmed that the actual employment supported by the agricultural land affected by construction activity is lower than the indicative capacity, and therefore the above assessment sets a hypothetical, 'worst-case' assessment of employment capacity rather than actual net employment reduction which would be influenced by commercial agreements between the Applicant and agricultural operations affected.

7.5.6. The landowner has negotiated with tenants to agree financial compensation or land swaps (or Heads of Terms for the same) where land within the Order Limits would not be available for agricultural use during construction (and operation) of the Proposed Development such that effects on viability of agricultural and non-agricultural businesses would not be adversely affected, and therefore changes to employment supported would be limited.

7.5.7. Where tenants are provided a land swap, Heads of Terms for replacement land (with land already in the Claydon Estate's ownership) that is equally productive, of similar size and quality, and accessible to each tenant, have been agreed where relevant such that effects on viability of those agricultural businesses would not be adversely affected.

7.5.8. As a result, during the construction phase (and continuing into the operational phase) there is likely to be a limited change in the ability for commercial operations that support agricultural and rural land-based employment to continue, which is likely to result in small changes in employment.

7.5.9. Where land is temporarily required on a short-term basis for construction activity but can then be returned to agricultural use, this land (except for access routes within it) would continue to be farmed after construction, with interim compensation arrangements agreed during the construction phase when that land is inaccessible where this applies.

7.5.10. The significance of this effect on people and businesses working in the agricultural and supporting (non-agricultural) sectors is reported within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** as

slight adverse (not significant) when embedded mitigation and compensation is considered.

Additional Mitigation for Effects on (Existing) Business and Commercial Activity

7.5.11. Various mitigation measures have been developed to address concerns about the viability of businesses adjacent to or partly within the Site, and commercial activity within and surrounding the Order Limits, where otherwise there may be a likely significant effect as a result of one or more environmental assessments/determinants of health.

7.5.12. This ensures that both actual environmental and access change is addressed as far as is reasonably practicable, and aims to address and provide a remedial action plan for any perceived effects, or unforeseen effects, on the operation of these businesses with the aim of providing for stability of the operation of the business and for the people that are employed or work in the area.

7.5.13. Relevant management plans include the:

- **Outline CEMP [EN010158/APP/7.2.2]**;
- **Outline CTMP [EN010158/APP/7.5.2]**;
- **Outline LEMP [EN010158/APP/7.6.2]**;
- **Outline OEMP [EN010158/APP/7.3.2]**; and
- **Outline DEMP [EN010158/APP/7.4.2]**.

Assessment of Residual Health Effects on (Existing) Business and Commercial Activity

7.5.14. The residual effects reported on business and commercial activity, and the employment supported by activities in agricultural and rural/land-based businesses within the Order Limits and adjacent to it have been assessed within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** as **slight adverse (not significant)** when embedded mitigation and compensation is considered.

7.5.15. This is principally due to the agreements in place between landowners and existing tenant activities that secure access to ‘land swap’ that will seek to ensure the stability of operations and employment.

7.5.16. Embedded and additional measures are also secured to manage the potential for environmental effects to affect the viability of these and adjacent commercial operations, which would seek to ensure the ongoing

viability (where this is within the control of the Proposed Development) of employment supported.

7.5.17. The **sensitivity** of the receptor is **medium** to **high** recognising that:

- Deprivation within directly affected communities and the sub-populations within them is very low;
- People generally have a limited capacity to adapt to changes in the socio-economic environment in this case (being dependant on access to land and on-going activity related to the use of the land);
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects are fair to good – however recognising that there is a prevailing level of uncertainty and pre-existing anxiety within the agricultural sector.

7.5.18. The **magnitude** of change is considered **small** to **medium** due to:

- The duration of effects being long-term (across the construction, decommissioning, and operational (including maintenance) phases); but
- a small-scale exposure to changes, with very few people affected in the context of the wider agricultural economy and compensation being agreed with landowners to provide for the continuation of most of the agricultural activity; with
- Severity predominantly related to minor change in morbidity (physical or mental health) and minor change in quality of life as a result of embedded mitigation and compensation that will limit the change in activity and provide continuity in most existing employment affected by the Proposed Development; and
- No service quality implications.

7.5.19. Based on these considerations, following additional mitigation, the significance of the effect of changes to local businesses, jobs and commercial activity as a determinant on health is considered to be **minor to moderate adverse** although in the context of compensation and mitigation, **not significant**.

Effects on **(New)** Employment **and Skills** (Construction and Decommissioning Phases; and Operational (including maintenance) Phase)

7.5.20. The positive socio-economic effects of the Proposed Development are reported in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**, which sets out that:

- A total of 600 direct, on-site FTE construction jobs will be supported for the duration of the 30-month construction programme.
- The employment supported will be in a range of different positions and skillsets across civil construction sectors, electrical and mechanical skills including specialised solar installation professionals and some non-construction and supporting roles such as security, process and administrative and transportation roles. Employment supported will also be in a range of tenures depending on the work package/contract and contractor at each phase of construction.

7.5.21. The significance of this effect is reported as **neutral/slight beneficial** in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** during the construction phase.

7.5.22. During the operational (including maintenance) phase, **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** reports that the Proposed Development would support around 24 FTE jobs, with additional staff attending when required for maintenance, replacement of faulty or end of service life solar equipment, vegetation management activities and cleaning.

7.5.23. The significance of this effect is reported as **neutral/slight beneficial** in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** during the operational (including maintenance) phase.

7.5.24. The construction phase is therefore likely to promote employment opportunities and the development of skills in the construction sector, and result in business/contract opportunities for existing local employers, resulting in financial gain and stability that can contribute to beneficial health pathways (prior to additional mitigation/enhancement).

Enhancement for Effects on **(New)** Employment **and Skills**

7.5.25. To help maximise the positive gain for the local economy from the beneficial effect arising from employment generation during the construction and operation (including maintenance) phase, an **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14.2]** supports the DCO Application.

7.5.26. This details commitments to work with partners and the local and regional construction supply chain to enhance the proportion of activities that can be accessed by local people (both in employment, unemployed and economically inactive or outside of the current labour market) and firms with relevant experience and competencies.

7.5.27. The main objectives of the **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14.2]** are cognisant of and informed by regional and local policy and strategy for employment and skills as detailed in published documents by the Council, with these joint objectives detailed below:

- Promote opportunities for people who are employed, unemployed and economically active and young people who are Not in Education, Employment or Training (NEET) to access employment and skills development opportunities;
- Create opportunities for businesses to tender for work and join the supply chain of the Proposed Development;
- Clearly define the workforce, skills and supply chain requirements of the Proposed Development and articulate these in a clear and timely way to relevant stakeholders involved at a County- and Regional-level in supporting education, access to employment, skills development and business engagement;
- Harness the motivational potential of the Proposed Development to inspire the next generation of talent, particularly, to confidently invest in a career and future in Buckinghamshire, benefitting all employers; and
- Contribute to an evidence base to support the planning and delivery of education and skills curriculum and training capable of delivering the workforce and skills needed across the County and wider Region, at the right time, to support the business competitiveness of all energy and construction projects.

7.5.28. This is in line with the objectives referenced within the 'Draft Vision and Objectives' Document for the Draft Buckinghamshire Local Plan **[Ref. 19]**, which highlights the need to ensure that the right infrastructure is provided for health, education, skills and training. The Buckinghamshire Vision **[Ref. 18]** also references the current challenges that Buckinghamshire are facing in regards to areas of deprivation with high levels of unemployment, which the Proposed Development will contribute to addressing through the **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14.2]**.

7.5.29. Through this enhancement strategy, existing workers and firms may be able to up/re-skill to the benefit of the Proposed Development but also supporting their own career development and strategic policy objectives to improve the skills base in green construction sectors that will aid future cumulative demand for similar skills across the region's renewable energy sector.

7.5.30. For determinants of health, this mitigation and enhancement strategy has the effect of promoting and enhancing the employment and skills

opportunities for local residents and businesses to enable social mobility and the security of employment. It focuses on locations within Buckinghamshire, and includes measures specifically targeted to sub-populations currently experiencing social inequality that may make them more vulnerable to health inequalities.

Assessment of Residual Health Effects on (New) Employment and Skills

7.5.31. The construction and decommissioning phases of the Proposed Development will support local employment and skills over a 30-month construction period in terms of direct employment and the opportunity for the retention of value for local businesses winning contracts (which may result in direct or indirect employment).

7.5.32. Additional measures are secured through the **Outline Employment, Skills and Supply Chain Plan [EN010158/APP/7.14.2]** that will promote these opportunities for Buckinghamshire residents, and target measures at maximising social mobility (for example where there are prevailing socio-economic and health inequalities).

7.5.33. The significance of this effect is reported as **neutral/slight beneficial** in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]** during both the construction and operational phases, as a result of the temporary, short-term nature of employment in the context of the existing (substantial labour market).

7.5.34. In terms of health-specific criteria, the **sensitivity** of the receptor is **low** to **medium** recognising that:

- Levels of deprivation and narrow inequalities across the wider residential labour market area are generally low, with pockets of high deprivation (albeit not within Buckinghamshire); and
- The community is predominantly ambivalent about employment generation as a result of the Proposed Development, but within the context of wider predominance of anxiety and concern about the Proposed Development more generally.

7.5.35. The **magnitude** of change is considered **small** to **medium** due to:

- The duration of effects being short-term (for construction) and long-term (but with low exposure/scale of effects) during the operational (including maintenance) phase; but
- Severity predominantly related to minor change in morbidity (physical or mental health) and minor change in quality of life as a result of the positive health effects of employment, skills and income; and
- No service quality implications.

7.5.36. Based on these considerations, following additional mitigation, the significance of the effect of changes to employment and skills as a determinant on health is considered to be **negligible** to **minor beneficial** and **not significant**.

Effects on Social Cohesion (Construction and Decommissioning Phases)

7.5.37. Effects on social cohesion may occur where (as referenced by National Policy Statement EN-1, Paragraph 4.4.3):

"*New energy infrastructure may…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*".

7.5.38. A consideration of the likely short-medium term, temporary non-local construction workforce has been undertaken in the context of effects on the capacity of tourist accommodation within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**.

7.5.39. This sets out that during the construction phase, an average of 36 workers are likely to be living in tourist accommodation temporarily, during working periods, to work on the Project.

7.5.40. It is not possible to accurately predict or mandate where workers will live, however it is noted that:

- There is a substantial peripatetic construction workforce in most regions, at any given time as identified by research undertaken by CITB;
- The number of non-local workers identified would be dispersed amongst existing tourist accommodation, which has a significant level of fluctuation seasonally (as set out in **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**);
- Workers are likely to return to their permanent home during non-working periods, and would continue to access services at their point of registration (for example, GP services and healthcare prescribing services) and in any case would contribute towards service provision through general taxation;
- The resident population of the Community Study Area is 14,306 - and workers are likely to disperse across a much wider area where affordable, available and convenient accommodation is available, therefore contributing only a negligible increase / change, on a temporary basis, to the resident population (0.26% of the Community Study Area).

7.5.41. This peripatetic, transient workforce is a normal characteristic of the construction sector, and forms part of the existing baseline (around 6% of construction workers at any point in time is likely to be staying away from home for work at any given time, based on CITB survey information).

7.5.42. As such, in the context of the nature of the temporary construction workforce and the scale and dynamic nature of the local community and accommodation capacity, it is unlikely that there would be a noticeable change in access to services, transport or the use of recreational resources for the existing residential community, resulting in a **negligible** to **minor adverse** effect that is **not significant**.

Additional Mitigation for Effects on Social Cohesion

7.5.43. Notwithstanding the likely negligible to minor adverse effects on social cohesion in terms of effects on accommodation, public services and community facilities, there may be perceptions of change relating to the number of construction workers at the Site, and concerns about worker behaviour in communities very local to the Proposed Development who would observe their presence on a daily basis.

7.5.44. Such perceptions may result in stress or anxiety, particularly for more sensitive or vulnerable sub-populations, and so additional mitigation measures relating to site and workforce management and community engagement is recommended within management plans as additional mitigation.

7.5.45. Communities may remain cautious of the presence of construction workforce in the area, and as such measures will be in place (as set out within this Report and secured through management plans) to manage the activity and behaviour of the workforce within the Site. Individual contractors will also likely require adherence to workforce codes of conduct as a matter of course for their employment.

7.5.46. Measures within the management plans relating to the promotion of community engagement, feedback, agency and accountability are considered important in promoting social cohesion by reducing anxiety of 'unknown' effects or environmental changes – these are set out at **Section 3.3** of this Report.

Assessment of Residual Health Effects on Social Cohesion

7.5.47. The construction phase will result in a temporary, short-term construction workforce seeking accommodation during working periods, likely in tourist sector accommodation in settlements within and around adjacent communities to the Site.

7.5.48. In terms of health-specific criteria, the **sensitivity** of the receptor is **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them is very low;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects are fair to good – however recognising that there is a prevailing level of uncertainty and pre-existing anxiety.

7.5.49. As a result, the **magnitude** of change is considered **small** due to:

- The duration of effects being short-term (for construction and decommissioning) with low exposure/scale of effects; and
- There being no (or very low) service quality implications.

7.5.50. Based on these considerations, the significance of the effect of changes to social cohesion as a determinant on health as a result of changes to the resident population is considered to be **minor adverse** and **not significant**.

7.6. Changes in Public Safety (Electromagnetic Fields and Radiation, Land and Water Contamination, and Major Accidents and Disasters)

Effects relating to Electromagnetic Fields and Radiation *(Operational (Including Maintenance) Phase)*

7.6.1. All electrical equipment emits electric and magnetic radiation. Power cables produce both electric and magnetic fields (EMF), which can potentially affect human health. The potential effects on human health caused by time-varying magnetic fields, such as those generated by AC cables, are due to induced current on functions of the central nervous system.

7.6.2. Electromagnetic radiation from underground cables is generally less than electromagnetic radiation from overhead powerlines because emissions from adjacent conductors within a cable tend to cancel each other out.

7.6.3. **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4] [APP-079]** proposed to scope out EMF as a potential source of significant effects, as the 400kV underground cable that would be required to connect the Rosefield Substation and National Grid East Claydon Substation would be minimal in length. The majority of underground cabling within the Site

to facilitate the connection between the Solar PV modules, Balance of Solar System (BoSS), Satellite Collector Compounds, BESS and Rosefield Substation would be up to 132kV.

7.6.4. As part of the application, the Applicant has undertaken an Electromagnetic Field Assessment **(ES Volume 4, Appendix 5.6: Electromagnetic Field Assessment) [EN010158/APP/6.4] [APP-084].** This confirms that the maximum magnetic fields generated by these cables remain below the acceptable exposure limit, the closest identified dwelling is 80.2m from the cable route, and **no significant effects** on human health are anticipated (paragraph 6.3.3).

7.6.5. When assessing the impacts of overhead power lines, it is important to consider the impact of both electric and magnetic fields. Underground cables generally cause a negligible electric field above ground but can cause a significant magnetic field, which is dependent on the current in the conductors.

7.6.6. The Planning Inspectorate set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4] [APP-080]** that in-combination impacts with the overhead lines on human health should be considered and significant effects assessed where they are likely to occur – this has been considered at Section 6.6 of **ES Volume 4, Appendix 5.6: Electromagnetic Field Assessment) [EN010158/APP/6.4] [APP-084]**, which concludes that:

- The transformers, PV inverters, substation and BESS produce smaller magnetic fields than that of the underground cables, thus, considering all sources of electromagnetic radiation and their relative locations, it is predicted that the cumulative magnetic and electric fields are likely to be below the acceptable exposure limits (and therefore **not significant**); and
- There are existing overhead lines in the baseline environment, particularly in the vicinity of the National Grid East Claydon Substation. Existing electrical infrastructure will comply with the ICNIRP reference levels and respect any required setback distances.
- Cumulative impacts with existing overhead lines in the baseline environment, particularly in the vicinity of the National Grid East Claydon Substation are predicted to be **not significant** based on the relative locations of existing and proposed electrical infrastructure relative to the receptors. Existing electrical infrastructure will comply with the ICNIRP reference levels and respect any required setback distances.

7.6.7. The Planning Inspectorate agreed (as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4] [APP-080]**) that heat

and radiation should be scoped out of the ES assessment, on the basis that it is not anticipated that there would be any significant sources of heat or radiation during either construction, operation (including maintenance) or decommissioning – resulting in a **negligible**, **not significant** effect.

Additional Mitigation for Electromagnetic Fields and Radiation

7.6.8. No additional mitigation is required for the management of potential effects of EMF or radiation on health.

Assessment of Residual Health Effects for Electromagnetic Fields and Radiation

7.6.9. EMF and radiation is considered to cause a **negligible** effect on people following the implementation of embedded mitigation (i.e. the design of the Proposed Development and the locations of sources of EMF relative to receptors), and this has been agreed through scoping.

7.6.10. In terms of health-specific criteria, the **sensitivity** of the receptor is **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them is very low;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects are fair to good – however recognising that there is a prevailing level of uncertainty and pre-existing anxiety.

7.6.11. The **magnitude** of change is considered **negligible** due to:

- The negligible exposure to effects and
- There being no service quality implications.

7.6.12. Based on these considerations, the significance of the effect of electromagnetic fields and radiation as a determinant on health is considered to be **negligible** to **minor adverse** and **not significant**.

Effects relating to Major Accidents and Disasters (Operational (Including Maintenance) Phase)

7.6.13. The Planning Inspectorate agreed (as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]** [**APP-080**]) that major accidents and disasters should be scoped out of the assessment, on the basis that by implementing recognised and approved safety legislation and

regulation, no significant effects in relation to major accidents and disasters are anticipated during the construction, operation (including maintenance) and decommissioning phases.

7.6.14. However, the impacts of major accidents and disasters are considered within the **BESS Plume Assessment Summary [EN010158/APP/7.13.2]**, **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4.2] [PDA-004]**, **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]** and **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]**.

7.6.15. The Applicant is committed to developing a safe BESS facility that would provide long and dependable operation. It is in everyone's interest that the selected BESS technology is robust, in particular with regards to safe operation.

7.6.16. The Applicant has undertaken a **BESS Plume Assessment Summary [EN010158/APP/7.13.2]** to assess the possible impacts in an emergency situation to receptors of the BESS in acknowledgement that there may be concern regarding the potential thermal runaway (where a battery cell enters an uncontrolled self-heating state).

7.6.17. The Applicant has consulted the UK Health Security Agency (UKHSA) on the methodology for the assessment, and both parties agree that at the detailed design phase a plume assessment would be commissioned based on atmospheric dispersion modelling; this would give an understanding of what would be emitted and the impact in comparison with air quality standards (in terms of health pathways).

7.6.18. The **BESS Plume Assessment Summary [EN010158/APP/7.13.2]** has considered the potential impacts from all types of battery failures, finding that in the occurrence of credible worst-case scenarios, nearby receptors are likely to remain unaffected relative to thresholds outlined in existing guidance. The summary states that any plume arising from a BESS fire from any type of battery failure would dissipate before reaching any sensitive receptors.

7.6.19. It sets out that arrangement and placement of the example design ensures receptors sensitive to the types of emergency situations associated with BESS failure are largely protected prior to implementation of specific emergency response planning or control systems, and deployment of these will only increase protection in these eventualities.

7.6.20. However, to ensure safe management of emergency situations by onsite workers and emergency responders, an Emergency Response Plan will be developed and deployed prior to construction of the BESS facility.

7.6.21. Overall, the Applicant considers that the **BESS Plume Assessment Summary [EN010158/APP/7.13.2]** provides and demonstrates a deep understanding of the risks of building and operating a large scale battery storage installation. It demonstrates that under day-to-day operation there is a low risk of an incident, and in the event of an incident the credible hazards are understood and have been evaluated at this concept design stage to demonstrate that the risk to the local population remains very low.

7.6.22. Following submission of the DCO Application, the Applicant has produced a **BESS Plume Assessment Summary [EN010158/APP/7.13.2]** and shared this with UKHSA. Subsequently, through written correspondence (which has been submitted to the examination at Deadline 1), the UKHSA has confirmed that:

- "Overall, the addendum provides a logical approach and assesses a worst-case scenario of chemical emission concentrations during a BESS fire event at relevant receptor locations. The findings of the addendum report alongside the previous submitted plume assessment suggests that the risk to public health for nearby receptors from chemicals emitted during a BESS fire event is likely to be low".

7.6.23. As such, in terms of health pathways and determinants, the assessment and agreement with UKHSA provides important assurance to the general public as to the agreed position on assessment of risks, which provides an improved sense of control to avoid or reduce the potential for anxiety relating to mental health and wellbeing.

Additional Mitigation for Major Accidents and Disasters

7.6.24. An **Outline BSMP [EN010158/APP/7.9.2]** sets out the key fire safety provisions for the Battery Energy Storage System (BESS) proposed to be installed at the Proposed Development including measures to reduce fire risk and fire protection measures. This Plan has three important implications in terms of health pathways:

- Ensuring that there is visibility and oversight of health and safety measures in collaboration with stakeholders with an interest or statutory responsibility for public health (such as the UK Health Security Agency (UKHSA) and Buckinghamshire Fire Authority);
- Providing security for the delivery of detailed plans and measures to reduce the risk of fire and other potential effects related to BESS on physical health and wellbeing; and
- Providing clarity and reassurance of the safety and security of design decisions (such as location and layout of the BESS), procedures (e.g. procurement, monitoring and testing) and elements (such as access arrangements for emergency vehicles) of the Proposed Development

which, through consultation and engagement, are considered to raise anxiety and stress in the community, thereby helping to address concerns relating to mental health and wellbeing.

7.6.25. The **Outline BSMP [EN010158/APP/7.9.2]** provides a clear list of pre-construction information requirements (Section 5) to enable the Applicant to demonstrate prior to construction that the Proposed Development would be implemented and operated safely.

Assessment of Residual Health Effects for Major Accidents and Disasters

7.6.26. The Planning Inspectorate agreed (as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]** [**APP-080**]) that major accidents and disasters should be scoped out of the assessment, on the basis that by implementing recognised and approved safety legislation and regulation, **no significant effects** in relation to major accidents and disasters are anticipated during the construction, operation (including maintenance) and decommissioning phases.

7.6.27. Nonetheless, the Application has considered the potential for such events, and presented clearly the measures in place to avoid or minimise risk. It is important to consider that despite measures being in-place, individuals and sub-populations may experience stress and anxiety related to the perception of effects which may cause detrimental effects on mental health and wellbeing.

7.6.28. As such, additional mitigation includes clear communication strategies, intended to inform and reassure communities. This Report aims to confirm and articulate the measures and health pathways, and additionally sets out the views of statutory public health stakeholders (UKHSA) about the Proposed Development's approach to ensuring public safety.

7.6.29. In terms of health-specific criteria, the **sensitivity** of the receptor is **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them is very low;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects are fair to good – however recognising that there is a prevailing level of uncertainty and pre-existing anxiety.

7.6.30. The **magnitude** of change is considered **small** due to:

- The negligible to very low or small-scale exposure to effects; and
- There being no service quality implications.

7.6.31. Based on these considerations, the significance of the effect of as a determinant on health is considered to be **minor adverse** and **not significant**.

Effects relating to Land and Water Contamination (Construction and Decommissioning Phases; and Operational (Including Maintenance) Phase)

7.6.32. **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]** presents an assessment of the likely significant effects arising during the construction, operation (including maintenance) and decommissioning phases of the Proposed Development on the water environment.

7.6.33. The chapter suggests that construction activities, the operation of equipment during the construction phase and operational activities have the potential to locally alter both flood risk and surface water drainage pathways, which could lead to environmental disaster.

7.6.34. In addition to this, construction activities, operational activities and the operation of equipment during the construction and decommissioning phase also have the potential to increase slit/pollutants entering surface water courses, which could have a negative impact on the overall water quality of the local watercourse.

7.6.35. The potential for human health to be affected by contamination of land and water (for example from spills, refuelling or mobilisation of contamination during construction, operation (including maintenance) and decommissioning activities) is reported in **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]**.

7.6.36. That assessment considers that:

- Construction and decommissioning activities could lead to localised contamination of soils from potential spills from the operation of construction plant or refuelling activities. If contaminated soils associated with past developments are identified, these could form a localised source of contamination if they are not managed correctly. There is the potential for contamination to affect human health and groundwater quality; and
- Operation (including maintenance) works could result in spillages and leaks of fuels, oils and chemicals, which could affect the near-surface soil and shallow geological units. Large numbers of vehicle movements are not anticipated within the Site during the operation (including maintenance) phase, so occurrences of accidental spillages are less

likely during this phase than the construction phase. There is the potential for contamination to affect human health and groundwater quality if these receptors come into contact with spillages or leaks of fuels, oils or chemicals.

7.6.37. It is important to note that with the site history indicating that land use has been predominantly agricultural, contamination may already exist which is associated with agriculture. This contamination could be due to the application of herbicides, pesticides and fertilisers, or due to leaks or spillages from agricultural machinery.

Additional Mitigation for Land and Water Contamination

7.6.38. The **Outline CEMP [EN010158/APP/7.2.2]**, **Outline DEMP [EN010158/APP/7.4.2]** and the **Outline OEMP [EN010158/APP/7.3.2]** set out measures to avoid damage to human health due to contamination, and to avoid, minimise or mitigate effects on the environment during construction and decommissioning works, and the operational (including maintenance) phase.

7.6.39. This includes managing risks from former agricultural activities such as foot and mouth burial pits, waste pits, pesticides and asbestos containing material, ensuring that land and groundwater receptors are protected from effects of contamination associated with historical usage of the land.

7.6.40. Examples of the measures secured include:

- Good housekeeping and site maintenance, including management of materials and waste;
- Maintain records relating to routine inspections, investigations, corrective actions and action schedules;
- Procedures to mitigate against erosion;
- Procedures to prevent disturbance of contamination;
- Emergency procedures to manage accidental spillages and leaks in order to minimise any risk to the land and groundwater during the construction phase; and
- Management plans to cover the use of HDD, including the use of drilling muds.

7.6.41. A piling risk assessment will be undertaken before the start of construction, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2.2]** and **Outline DEMP [EN010158/APP/7.4.2]**. This will minimise impacts on groundwater as a result of piling activities.

7.6.42. To manage the potential impact of firewater associated with the operational BESS, the procedures for managing the firewater and mitigating any impact to the environment are detailed in and secured by the **Outline OEMP [EN010158/APP/7.3.2]** and requirements for the control and safety of the BESS are detailed in and secured by the **Outline BSMP [EN010158/APP/7.9.2]** and the **Outline Drainage Strategy [EN010158/APP/7.11.2]** which ensures that any firewater is collected, preventing release to land or groundwater.

Assessment of Residual Health Effects for Land and Water Contamination

7.6.43. Following the consideration of both embedded and additional mitigation, **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2.2]** concludes that there is a **slight adverse** or **neutral** effect on human health relating to contamination that is **not significant** during the construction, decommissioning or operational (including maintenance) phases.

7.6.44. For the water environment, **ES Volume 2, Chapter 16: Water [EN010158/APP/6.2.2]** sets out that with embedded and additional mitigation referred to in this Report, residual effects on all receptors would be **minor adverse**, and therefore, **not significant** during the construction, decommissioning or operational (including maintenance) phases.

7.6.45. In terms of health-specific criteria, the **sensitivity** of the receptor is **medium** recognising that:

- Deprivation within directly affected communities and the sub-populations within them is very low;
- There is predominant anxiety and concern in the community relating to potential change; but
- That prevailing health inequalities are limited and indicators of health status relating to the potential for effects are fair to good – however recognising that there is a prevailing level of uncertainty and pre-existing anxiety.

7.6.46. The **magnitude** of change is considered **small** due to:

- The negligible to very low or small-scale exposure to effects; and
- There being no service quality implications.

7.6.47. Based on these considerations, the significance of the effect of the potential for land, groundwater or surface water as a determinant on health is considered to be **minor adverse** and **not significant** during the construction, decommissioning or operational (including maintenance) phases.

8. Cumulative Effects on Health

8.1. Effects on Air Quality

8.1.1. The Zone of Influence (ZoI) for air quality is 250m from the Order Limits, influenced by the study area for human receptors for demolition, earthworks and general construction activities and based on the Institute of Air Quality Management (IAQM) construction dust guidance. This guidance inherently considers thresholds for effects on human health. As a result, the potential for cumulative effects on receptors is spatially limited.

8.1.2. The cumulative assessment considers the potential for construction phase effects from dust and particulate matter emissions from Site activities, including the operation of the construction equipment, and effects from road traffic exhaust emissions during construction operation.

8.1.3. The assessment in **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** Table 17.4] for air quality human health impacts, there is a low of negligible risk for every activity.

8.1.4. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** paragraphs 17.7.1 to 17.78), it is noted that the predicted cumulative construction phase Light Duty Vehicles generation slightly exceeds the Environmental Protection UK and IAQM 2017 guidance.

8.1.5. In spite of these exceedances, based on the review of the baseline conditions, annual mean NO_2 and PM_{10} concentrations at the Site will be well below Air Quality Standards, with there being a minimal number of high street sensitive receptors being located close to affected roads. Traffic effects during construction and decommissioning will be limited to a short period at each phase, while all short listed development are expected to have a detailed CTMP to control road traffic exhaust emissions.

8.1.6. It is important to note that impacts on Local Wildlife Sites (LWSs) are of particular relevance to human health, with these sites hosting rich biodiversity that can contribute to the pollination of crops, pest control and air/water purification, which can improve food security and mitigate against climate change. Access to these spaces can also reduce stress and anxiety, in addition to increasing physical activity.

8.1.7. In summary, the Proposed Development and all other short listed developments are not expected to generate traffic that exceeds the Design Manual for Roads and Bridges LA 105 Air Quality screening criteria[9] on any construction or decommissioning traffic route within 200m of Local Wildlife Sites (LWSs).

8.1.8. Due to this, it is unlikely that the additional cumulative construction and decommissioning traffic emissions from the Proposed Development and all other shortlisted development would cause significant adverse effects at LWSs. This suggests that with appropriate mitigation in place (as secured **in Outline CEMP [EN010158/APP/7.2.2]**, the **Outline CTMP [EN010158/APP/7.5.2]** and the **Outline DEMP [EN010158/APP/7.4.2]**), construction and decommissioning phase inter-project cumulative effects on air quality as a determinant of human health would not be significant.

8.1.9. With the Proposed Development and all short listed development not expected to generate traffic exceeding the relevant Design Manual for Roads and Bridges LA 105 Air Quality screening criteria once operational, and all committed development expected to follow best practice mitigation measures, the cumulative effect on air quality as a determinant within the operational phase will not be significant. Mitigation for both the Proposed Development and other committed developments would include site-specific Operational Environmental Management Plans (OEMPs) to minimise road traffic exhaust emissions.

8.1.10. As a result of this, it can be confirmed that any cumulative/inter-project effects related would not worsen air quality to a degree that would have significant harm on human health.

8.2. Effects on Noise and Vibration

8.2.1. The ZoI for noise and vibration is 300m from the Order Limits, determined by guidance set out in BS 5228-1: 2009+A1: 2014 and BS 5228-2: 2009+A1: 2014.

8.2.2. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (See Table 17.4 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**), no inter-project cumulative effects during the construction and operational (including maintenance) phases are anticipated.

[9] Light Duty Vehicles equal to or more than 1,000 Annual Average Daily Traffic or Heavy Duty Vehicles equal to or more than 200 Annual Average Daily Traffic

8.2.3. When considering noise and vibration as a common receptor, the inter-project cumulative effect is expected to be a minor adverse at Sion Hill Farm, suggesting that noise levels would not exceed the low magnitude of impact criteria at the surrounding receptors. It is concluded that provided there is adequate mitigation for National Grid East Claydon Substation, residual inter-project cumulative effects would **not be significant**.

8.2.4. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** paragraphs 17.7.396 to 17.7.411), East Claydon BESS, Tuckey Farm Solar, Calvert Solar Park and HS2 (and associated developments) are identified as developments that have the potential to act cumulatively with the Proposed Development.

8.2.5. When looking at the **East Claydon BESS** development, the ES chapter prepared for this development suggested that the predicted noise levels from construction works at Sion Hill Farm would be lower than the daytime significance threshold of 65 dB $L_{Aeq,T}$, while construction activities for the Proposed Development would take place closer to Sion Hill Farm, and would in turn generate higher levels of daytime noise when compared to the **East Claydon BESS**. As a result, the cumulative construction noise effects would not be greater than the Proposed Development in isolation.

8.2.6. In addition to this, when considering the predicted daytime and night-time operational noise levels cumulatively for **East Claydon BESS** and the Proposed Development, the resultant inter-project cumulative noise levels would constitute a direct, permanent, minor adverse effect that would **not be significant**.

8.2.7. With regards to **Tuckey Farm Solar**, as a result of the location of noise emitting infrastructure associated with this development, resultant noise levels at receptors considered within the assessment for the Proposed Development would be so low that they would not act cumulatively. Due to this, the inter-project cumulative effects are **not significant**.

8.2.8. Despite **Calvert Solar Park** not having a noise impact assessment report, the Planning, Design and Access Statement suggests that emitted operational noise levels would be “low and unlikely to be discernible by local residents”. With noise emitting equipment associated with **Calvert Solar Park** being situated in the south-western extents of the application site, result noise levels at receptors considered within the assessment for the Proposed Development would be at a sufficiently low level that they would not act cumulatively (**non-significant inter-project effect**).

8.2.9. For noise sensitive receptors in the vicinity of **HS2**, the predicted operation (including maintenance) phase noise levels from the Proposed

Development are predicted to be considerably lower than the noise generated by HS2, resulting in a **non-significant inter-project cumulative effect**.

8.2.10. In summary, no likely significant effects are predicted during the operational (including maintenance) phase of the Proposed Development, and hence the Applicant considers that inter-project cumulative effects are not significant.

8.3. Landscape and Visual Effects

8.3.1. The ZoI for landscape and visual effects is set at 10km from the Order Limits for the Proposed Development, in order to capture the likely interaction between views of multiple projects by receptors that include users of linear routes (including PRoW) and residential properties.

8.3.2. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** summarises that regarding the cumulative effect of the Proposed Development and National Grid East Claydon Substation (see paragraphs 17.6.9 to 17.6.115 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**).

8.3.3. The assessment concludes that:

- The only locations where there would be views of both developments at the same time would be from a section of Winslow Road/East Claydon Road and from sections of the PRoW network between East Claydon/East Claydon Road and to within Parcel 3 (incorporating PRoWs ECL/3/1, ECL/3/2, ECL/3A/1, ECL/4/1, ECL/4/2, ECL/5/1, ECL/6/1).
- Residential properties at Sion Hill Farm and Station House would potentially have the combined views of the Proposed Development and the National Grid East Claydon Substation development.
- If both the Proposed Development and the National Grid East Claydon Substation were operational in combination, this would result in limited additional views from the first floor of the Sion Hill Farm, resulting in inter-project effects being a major adverse at Years 1 and 10 of operation (**significant**).
- If both the Proposed Development and the National Grid East Claydon Substation were operational in combination, this would result in a substantial increase in the scale of effects resulting from near distance views of the National Grid East Claydon Substation development. In Year 1, large scale effects would therefore result in a substantial magnitude of effect on visual amenity, creating a major adverse inter-project cumulative effect (significant) at Station House. In light of

additional mitigation being secured within the **Outline LEMP [EN010158/APP/7.6.2]** such as perimeter fencing for the Proposed Development being regularly checked, new hedgerow planting throughout the Order Limits to provide screening and biodiversity benefits and the control of litter/vandalism , it is expected that there would be a medium scale of change resulting in a substantial moderate effect on visual amenity.

- As a result, the inter-project cumulative effect of the National Grid East Claydon Substation being developed in combination with the Proposed Development would be major/moderate at Year 10 (**significant**).
- In regards to PRoW, in the scenario that the National Grid East Claydon Substation development is operational in combination with the Proposed Development, large scale effects on views would extend further north approximately up to Winslow Road/East Claydon Road. The assessment concludes that inter-project effects in PRoW for both Years 1 (major adverse) and 10 (moderate adverse due to additional mitigation in the form of **Outline LEMP [EN010158/APP/7.6.2]**) would be **significant**.

8.3.4. The inter-project cumulative effects assessment for Landscape and Visual is provided in Table 17.9 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**, which considers the cumulative effect of the Proposed Development with 19 others.

8.3.5. The assessment concludes that there would significant cumulative effects from the following developments on receptors assessed within **ES Volume 2, Chapter 10: Landscape and Visual [EN010158/APP/6.2] [APP-053]**:

- **National Grid East Claydon Substation** – moderate adverse effect in within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, LCA 7.3: Claydon Bowl, North Buckinghamshire Way and The Midshires Way, Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood, PRoW between East Claydon/East Claydon Road and to within Parcel 3;
- **East Claydon BESS (23/03875/APP)** – moderate adverse effect within the construction and decommissioning phases on PRoW between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road, and moderate adverse effects within the construction, decommissioning and operational phases on LCA 5.7: Hogshaw Claylands (Year 1 and Year 10), LCA 7.3: Claydon Bowl (Year 1 and Year 10), Granborough (Year 1 only), North Buckinghamshire Way and The Midshires Way (Year 1 only), Bernwood Jubilee Way (Years 1 and 10), PRoW between Botolph Claydon and Runt's Wood (Years 1 and 10), PRoW between East Claydon/East Claydon Road and to within Parcel 3 (Years 1 and 10)

Sion Hill Farm (Years 1 and 10) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10);

- **East Claydon Greener Grid Park (25/01297/APP)** - moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood and PRoW between East Claydon/East Claydon Road and to within Parcel 3, and moderate adverse effects within the construction, decommissioning and operational phases on North Buckinghamshire Way and The Midshires Way (Year 1 only) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10);
- **Tuckley Solar Farm (19/00983/APP)** – moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, LCA 7.3: Claydon Bowl, Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood and PRoW between East Claydon/East Claydon Road and to within Parcel 3, and moderate adverse effects within the construction, decommissioning and operational phases on North Buckinghamshire Way and The Midshires Way (Year 1 only) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10);
- **East West Rail (25/00013/DCO)** – moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands and North Buckinghamshire Way and The Midshires Way , Bernwood Jubilee Way, PRoW between Botolph Claydon and Runt's Wood and PRoW between East Claydon/East Claydon Road and to within Parcel 3, and moderate adverse effects within the construction, decommissioning and operational (Year 1 and Year 10) phases on LCA 7.3: Claydon Bowl; and
- **Longbreach Solar Farm (25/01865/APP)** - moderate adverse effect within the construction and decommissioning phases on LCA 5.7: Hogshaw Claylands, and moderate adverse effects within the construction, decommissioning and operational (Year 1 and Year 10) phases on LCA 5.7: Hogshaw Claylands, LCA 7.3: Claydon Bowl, North Buckinghamshire Way and The Midshires Way (Year 1 only), Bernwood Jubilee Way (Years 1 and 10), PRoW between Botolph Claydon and Runt's Wood (Years 1 and 10), PRoW between East Claydon/East Claydon Road and to within Parcel 3 (Years 1 and 10), Sion Hill Farm (Years 1 and 10) and Swan's Way/Outer Aylesbury Ring (Years 1 and 10).

8.3.6. When looking at residual cumulative effects of the six cumulative developments with the Proposed Development, significant residual cumulative effects are recorded at the following receptors:

- LCA 5.6: Claydon Valley (Operation – Years 1 and 10);

- LCA 5.7: Hogshaw Claylands (Construction, decommissioning and operation – Years 1 and 10);
- LCA 7.3: Claydon Bowl (Construction, decommissioning and operation – Years 1 and 10);
- Granborough (Construction and decommissioning);
- North Buckinghamshire Way and The Midshires Way (Construction, decommissioning and operation – Year 1);
- Swan's Way/Outer Aylesbury Ring (Operation – Years 1 and 10);
- Bernwood Jubilee Way (Construction, decommissioning and operation – Years 1 and 10);
- PRoW between Botolph Claydon and Runt's Wood (Construction, decommissioning and operation – Years 1 and 10);
- PRoW between East Claydon Road/Parcel 3 and Granborough/ Hogshaw Road (Construction and decommissioning);
- PRoW between East Claydon/East Claydon Road and to within Parcel 3 (Construction, decommissioning and operation – Years 1 and 10); and
- Sion Hill Farm (Operation – Years 1 and 10).

8.3.7. In summary, likely significant effects are predicted during the operational (including maintenance) phase of the Proposed Development, and hence the Applicant considers that inter-project cumulative effects related to this determinant of health have the potential to be significant (in the context of the already significant effects related to the Proposed Development.

8.4. Effects on Traffic, Transport and Access

8.4.1. The ZoI for transport and access is defined as developments that result in significant traffic flows (in excess of 10%) that result in construction or operational traffic on the study area road network during the proposed construction period. This is due to the fact that projects that generate significant traffic on the study area that coincide with the Proposed Development may result in inter-project cumulative effects on the network.

8.4.2. In terms of the potential relevant effect of traffic and access effects on health pathways, the cumulative assessment considers potential effects on severance, pedestrian delay and Walking, Cycling and Horse rider (WCH) user amenity, fear and intimidation, accidents and road safety from traffic associated with the construction and operational phases.

8.4.3. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** suggests that the inter-project cumulative effect of

the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** Table 17.4) on users of the road network and sensitive locations (e.g. schools, hospitals and residential areas with provision for walking and cycling) would not be significant due to the low number of AIL movements associated with the Proposed Development.

8.4.4. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** paragraphs 17.7.412 to 17.7.419) , there is potential for temporary construction related effects on all road users and sensitive locations (e.g., hospitals, schools, residential areas with provision for walking and cycling). Two committed developments have been identified where significant traffic flows could interact:

- 22/00125/REF: New Category C Prison, known at Grendon Springhill 2; and
- HS2.

8.4.5. When looking at Grendon Springhill 2, only operational traffic flows are provided, with it being assumed that the prison would be fully operational at the time of peak construction traffic generation. Despite this not taking account of the fact that planning conditions will need to be discharged and construction works will need to be started which could take some time, this provides a robust assessment scenario.

8.4.6. With 2029 HS2 traffic flows not being available, existing HS2 flows operating at the same time as the traffic surveys are used to provide a robust assessment.

8.4.7. Inter-project cumulative effects would occur on the A41 corridor, with no traffic from any other committed development appearing to use roads/routes[10] where the Proposed Development has the highest impact.

8.4.8. Inter-project cumulative effects of the AIL access route would be limited due to the small number of AIL movements, and with these movements set to be police escorted and subject to a specialist Transport Management Plan, the likely interactions with cumulative traffic flows and other road users are **naturally managed** or **avoided**.

[10] Station Road/Dewes Lane, Snake Lane/Fiddlers Field, Claydon Road or Granborough Road.

8.4.9. The Proposed Development would include the following management plans relevant to health pathways for traffic and access effects to be avoided, reduced or managed:

- **Outline CEMP [EN010158/APP/7.2.2]**;
- **Outline CTMP [EN010158/APP/7.5.2]**; and
- **Outline DEMP [EN010158/APP/7.4.2]**.

8.5. Socio-economic Effects

8.5.1. The ZoI for population can be defined as the Community Study Area (as shown in **ES Volume 3, Figure 14.4: Community study area [EN010158/APP/6.3] [APP-073]**) and the Construction Labour Market Area (CLMA) Focus Area (as shown in **ES Volume 3, Figure 14.3: CLMA Focus Area [EN010158/APP/6.3] [APP-073]**). These areas are determined by the likelihood of receptors being identified as being affected by the Proposed Development within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**.

8.5.2. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** suggests that the inter-project cumulative effects of the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** Table 17.4) on employment and contribution to GVA, agricultural economy, tourism and the tourist economy, and community access are **not significant**. Cumulative mitigation requirements are only needed for effects on employment and contribution to GVA, with the applicant committing to working with other developers where relevant through the **Outline Employment, Skills and Supply Chain Strategy [EN010158/APP/7.14.2]**.

8.5.3. Paragraphs 17.7.356 to 17.7.395 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** considers the likelihood for significant cumulative socio-economic effects on 'population' or 'socio-economic receptors' (e.g. effects relation to construction, economic activity, and adverse effects relating to agricultural employment capacity).

8.5.4. As set out in Table 17.10 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**, there are several solar and non-solar projects that are either currently in planning or under development that could have create inter-project employment and economic effects.

8.5.5. During the construction phase of the Proposed Development, inter-project cumulative effects may arise in-combination with other infrastructure projects (including NSIPs) likely to share similar construction skillsets and produce operational employment.

8.5.6. It is estimated that the cumulative solar projects could support:

- around **1,905** construction years of employment, **1,500** construction years of employment, resulting in an average of **190** temporary net full time equivalent jobs per year across the CLMA; and
- an average of 600 jobs supported by the Proposed Development (for 30-months).

8.5.7. This would temporarily create demand equivalent to **2.5%** of existing resident construction workers in the CLMA Focus Area, which would **not be significant**.

8.5.8. Based on standard GVA per workers rates and daily spending set out within **ES Volume 2, Chapter 14: Population [EN010158/APP/6.2] [APP-057]**, the cumulative solar projects would generate £28.7m per year in the form of GVA and £1m per year in the form of spending, contributing to 1.3% of the current construction GVA. In turn, the cumulative GVA/spend supported by construction is likely to result in **temporary, minor beneficial effect (not significant**).

8.5.9. When looking at inter-project temporary effects on tourist accommodation occupancy during construction and assuming that 50 construction workers use temporary accommodation when considered against the average number of bed spaces, it is likely that temporary accommodation providers would be able to cater for the tourist population in addition to any temporary construction staff during the construction period of all cumulative projects.

8.5.10. As a result, there is likely to be a temporary, slight residual effect on occupancy rates as a result of increased visitor numbers to the area. This could be a beneficial economic effect, but would **not be significant**.

8.5.11. As set out in Table 17.3 and Table 17.10 of **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]**, there are several solar projects likely to be constructed and operated within Buckinghamshire that are either currently in planning or under development, which are likely to lead to a reduction in the indicative employment capacity of agricultural land.

8.5.12. The cumulative projects comprise approx. 1,260 hectares of predominantly agricultural land, and when applying an average employment rate per ha in Buckinghamshire using Defra data, this land is projected to have cumulative indicative employment capacity for between 37-42 FTE jobs (accounting for 1.7% to 1.9% of employment capacity). With this identified to be a low magnitude of change upon the agricultural

economy, inter-project cumulative effect would be a **temporary, long term, minor adverse (not significant)** effect on the agricultural economy.

8.5.13. There are mitigating factors to this cumulative effect which relate to health pathways, and mean that this estimated reduction is a 'worst case' assessment:

a) Any cumulative assessment of the potential impact on the agricultural economy is hypothetical and does not consider individual landowner agreements could safeguard the employment supported by landholdings by moving the employment and or productivity to a nearby site;

b) Any project developing on agricultural land would be subject to a consideration of statutory compensation relating to the operation of resident agricultural operations.

c) Uplift in other sectors (construction and energy – see below) will occur, which is a normal activity within any economy. Employment in these sectors will be supported by individual project commitments for promoting local skills and employment as required by NPS EN-1.

8.5.14. The Applicant has committed to an **Outline Skills, Employment and Supply Chain Plan [EN010158/APP/7.14.2]** which is secured as a Requirement of the **Draft DCO [EN010158/APP/3.1.3]**, and includes cumulative collaboration as a key tenet. It includes a commitment to contribute to an evidence base to support the planning and delivery of education and skills curricula and training capable of delivering the workforce and skills needed across the Region, at the right time, to support the business competitiveness of all energy and construction projects.

8.5.15. It is further anticipated that each individual NSIP would also produce similar strategies to enhance and promote local employment, skills and supply chain opportunities and as set out above the Applicant is keen to collaborate with developers, sectors and public and voluntary and community stakeholders in this regard.

8.6. Land and Water Contamination

8.6.1. The ZoI for land, soil and groundwater effects is 1km from the Order Limits, determined with regard to identifying land, soil and groundwater related receptors that could be impacted by the construction, operation (including maintenance) and/or decommissioning of the Proposed Development.

8.6.2. The assessment at **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** summarises that regarding the cumulative effect of

the Proposed Development and National Grid East Claydon Substation (See **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** Table 17.4), the potential for risks to land contamination or effects on groundwater quality which may influence health pathways is not anticipated to be significant, assuming similar management plans are required to prevent contamination.

8.6.3. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments on water (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** paragraphs 17.7.420 to 17.7.422), there are six developments within 1km of the Order Limits considered to contribute to the potential for temporary construction related accidental spills to have a combined effect on groundwater.

8.6.4. The existence of mitigation plans and assessments agreed with relevant authorities suggests that inter-project effects on water in relation to accidental spill and/or slit runoff in the construction phase, and flood risk and water drainage in the construction, operational and decommissioning phases would **not be significant**.

8.6.5. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments on soil (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** paragraphs 17.7.31 to 17.7.44), there are six existing and/or approved developments within 1km of the Order Limits considered to contribute towards an increase in soil disturbance and reduction in agricultural land quality and productivity, with land set to be removed from agricultural production during the construction phase. In addition to this, soil will also be temporarily disturbed due to soil handling

8.6.6. Despite methodology suggesting that a permanent land loss of over 20ha would be considered as a high magnitude of change from the baseline, all soils within the developments are mapped/expected to be Grade 3b (which is non-BMV land) and heavy textured. This suggests that the soil resilience and sensitivity is identified to be medium, resulting in a large adverse significant effect from the six cumulative developments on soil.

8.6.7. The **Outline Soil Management Plan (SMP) [EN010158/APP/7.7.2]** has been produced to prevent damage to soil structure, as well as potential damage to field drains (and subsequent effects on drainage of agricultural land). As a result of this, despite the cumulative effect being significant due to the magnitude of effect, there will not be a cumulative effect on BMV land, with the overall effect on soil and agricultural being mitigated through the use of a soil management plan.

8.6.8. Regarding the cumulative effect of the Proposed Development and other existing development and/or approved developments on land and ground (see **ES Volume 2, Chapter 17: Cumulative Effects [EN010158/APP/6.2.2]** paragraphs 17.7.27 to 17.7.30), there are six developments within 1km of the Order Limits considered to contribute to impacts including the potential for temporary construction related accidental spills, run-off from construction activities, geological units being physically affected by excavations and mobilisation of existing contamination.

8.6.9. No interaction of impacts on receptors associated with land would be expected between the Proposed Development and ongoing/approved developments within the short list, as all potential impacts relating to land would be limited in lateral extent. As result, inter-project cumulative effects would **not be significant**.

8.6.10. Despite there being potential for adverse effects on ground water from more than one project to have a combined effect on ground water receptors, all six developments will be subject to respective mitigation plans agreed with relevant authorities. As a result, there would be **no inter-project cumulative effect**, suggesting that the **chances of significant inter-project cumulative effects** occurring on groundwater would be **low**.

8.7. Cumulative/Inter-Project Effects – Summary for Health Pathways

8.7.1. The Proposed Development and cumulative schemes considered are not considered to result in additive effects that would combine to increase the level of effect on individual receptors to a significant scale across most relevant determinants of health (including noise, air quality, land and water contamination, transport and access and socio-economics).

8.7.2. In each case, an appropriate ZoI has been established based on guidance and/or the likelihood of interaction of cumulative effects from different projects that captures the spatial scale of impacts, which in most cases is limited.

8.7.3. Furthermore, where practicable the Applicant has committed to management plans and embedded mitigation that represents best practice and, in most cases, inherently considers thresholds that are determined by the potential for effects on health and wellbeing.

9. Summary/Conclusions

9.1.1. This Health Effects Report has been undertaken in order to address concerns raised by ExA in the **Examining Authority's section 89(3) letter to the applicant** [PD-005] that "*whilst the **Health and Wellbeing Summary Statement** [APP-083] draws conclusions on the significance of effects on human health, it does not set out clearly how these conclusions were derived*" and to set out the "*assessment of, and conclusions on likely effects on human health should be contained in one document*". It aims to:

- Summarise, in a single document, how health and wellbeing has been considered in the development of the Proposed Development including through design, impact assessment, and the approach to consultation and engagement;
- Set out where individual topic assessments have considered health and wellbeing effects, and report them in terms of significance, applying a health 'lens'; and
- Demonstrate regard to and consideration of guidance on the assessment of effects on health and wellbeing.

9.1.2. Fundamentally, this document is intended to provide a clear assessment of the health and wellbeing effects of the Proposed Development, in-line with standard industry guidance and in accordance with the requirements of legislation and national policy.

9.1.3. This has the benefit of providing a clear application of standard health guidance as an additional layer to the topic-specific methodology, in terms of the significance of health effects – which includes consideration of:

- The ability to deliver current health policy and/or the ability to narrow health inequalities, as evidenced by referencing relevant policy and effect size and in the context of community feedback on the importance of effects;
- Effects in the context of regulatory threshold or statutory standards;
- Potential changes in the health baseline of the population; and
- Health priorities for the relevant study area.

Legislative & Policy Context and Guidance

9.1.4. The legislative and policy context is clear regarding the approach to assessment of health and wellbeing effects from development – principally driven by the EIA Regulations, and National Policy Statements (principally NPS EN-1 and NPS EN-3).

9.1.5. The approach taken by the Applicant has been in accordance with the legal requirements and policy-defined scope for the assessment of potential impacts on health and wellbeing.

9.1.6. In addition, the Applicant has sought to review, understand and apply all relevant guidance to the scoping and assessment of significance of health and wellbeing effects – including drawing on ISEP (formerly IEMA) guidance, and the technical guidance and standards for impact assessment across individual topic areas / determinant of health.

Prevailing Health Context & Inequalities

9.1.7. The Applicant has had regard to the publshed policy, strategy and research by statutory bodies at a national and local level responsible for public health, including UKHSA and Buckinghamshire Council.

9.1.8. This has helped to identify the pre-existing challenges and risks to health, the prevailing issues relating to measures of public health and health inequalities, and the focus for considering and promoting health in the context of the Proposed Development.

9.1.9. In parallell, public datasets have been reviewed and articulated to understand the overall prevailing health baseline, demographic characteristics, and receptors with high sensitivity to inform the approach to assessment of health and wellbeing effects.

Determinants of Health and Potential Significant Effect Pathways

9.1.10. There are a number of relevant wider determinants of health and wellbeing, identified in-line with the guidance and literature review set out in this Report, that have the potential to be exacerbated by the Proposed Development. In addition, some of these effects have the potential to be experienced differently or more acutely where receptors, groups and sub-populations are more sensitive to change.

9.1.11. In most cases, these sensitivites are captured within the inherent standards and thresholds for impact assessment – for example for noise, air quality and traffic and transport effects. As set out in NPS EN-1 (paragraph 4.4.7) "*Generally, those aspects of energy infrastructure which are most likely to have a significantly detrimental impact on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either by themselves constitute a reason to refuse consent or require specific mitigation under the Planning Act 2008*".

9.1.12. On review of the Proposed Development and the assessment of effects identified within the ES, and applying health-specific scoping and

assessment criteria to the industry-standard definitions of the wider determinants of health, the following assessment areas have been considered within this Report:

- Effects relating to **Air Quality**;
- Effects relating to **Noise**;
- Effects relating to **Landscape and Visual Amenity** (including Glint and Glare);
- Effects relating to **Traffic, Transport and Access** (including recreational access and enjoyment of the natural environment via PRoW);
- Effects relating to **Socio-economics** (including effects on existing employment and business viability, new employment and skills, and social cohesion); and
- Effects relating to **Public Safety** (including electromagnetic fields and radiation, major accidents and disasters, and land and water contamination).

Mental Health and Wellbeing

9.1.13. It is important that both physical and mental health and wellbeing are considered in the context of the Proposed Development – for the latter, the pure application of standard thresholds and guidance may not be enough to confirm that pathways to adverse mental health have been addressed.

9.1.14. As such, the Applicant has considered and applied guidance from ISEP (formerly IEMA) and reviewed concerns from the local community, in order to provide an assessment and secure subsequent mitigation that may help to address the potential for stress / anxiety or the perception of adverse environmental effects manifesting as adverse mental health.

9.1.15. Feedback received from stakeholders and the public during the pre-application period to help to shape and scale the sensitivity attributed to different mental health pathways – including:

- The need for clear, transparent and meaningful engagement and consultation to demonstrate community feedback in considering the scheme design and the approach to mitigation measures;
- Perceptions of visual/open countryside being industrialised – mental health can relate to the control people feel they have over their physical environment;
- Footpaths, accessibility and active recreation;

- The potential for mental health effects relating to the loss of employment or socio-economic effects in the agricultural (and supporting) sectors;
- The potential for residential amenity to be affected, reducing house prices and financial stability; and
- The need for a review of the health implications related to electromagnetic radiation, concern about which has the potential to raise stress and anxiety.

9.1.16. The Report sets out that in the context of concerns about the assessment of effects on mental health and wellbeing:

- Engagement has been undertaken via the pre-application statutory and non-statutory consultation and bilateral and community engagement processes set out within the Appendices to the Consultation Report, which have provided adequate provision of information and consideration of community and stakeholder feedback in the approach to design and assessment development;
- Key environmental assessments relating to the potential for effects on mental health have been undertaken (for example relating to noise and air quality), and effects mitigated to their fullest extent such that residual effects are not significant where practically possible;
- Enhancements have been provided to the long-term accessibility of the area in order to promote and enhance physical and mental wellbeing; and
- While mental health and wellbeing is individual, subjective and experienced through a range of external factors beyond the Applicant's control, the Applicant considers that the approach taken to provide information and engage and consult, clearly and transparently assess and mitigate significant environmental effects (where practicable) and secure enhancement measures demonstrates that appropriate measures have been taken to address potential effects on mental health and wellbeing.

Mitigation, Management and Enhancement

9.1.17. The Report describes the determinants and potential pathways to health and wellbeing effects, and how receptors may be affected by different activities and phases of the Proposed Development, by determinant.

9.1.18. In doing this, it is important to set out the path to the final design of the Proposed Development, and the process to iterative design change, as well as the identification and securing of embedded mitigation.

9.1.19. Much of this embedded mitigation has been informed by standards and good practice measures to reduce the potential for significant effects, and as set out in this Report, it has also been influenced by the feedback received from statutory consultees and the community through progressive consultation and engagement activities.

9.1.20. In this way, the description of effects (before additional mitigation) helps to identify where adverse health effects have been avoided, and what additional measures are recommended to take a 'plan-monitor-manage' approach to manage potential effects.

9.1.21. Additional mitigaiton is then described in relation to the determinants of health for the Proposed Development – as set out above, this is not limited to the application of standard paractice, but has been informed by the approach needed to provide community agency, transparency, engagement and a feedback mechanism for all potential effects.

Summary of Health Impacts

9.1.22. In most cases, on application of standard health assessment criteria, the Proposed Development is unlikely to result in a signifcant residual effects on health and wellbeing – however it is acknowledged that this is dependant on the full and comprehensive application of additional mitigation secured by the Certified Documents within the application and referenced throughout this Report and the ES. A summary of the effects is set out in **Table 7.**

9.1.23. The Report concludes that while individuals and more sensitive sub-populations may experience the effects of the Proposed Development more acutely, that the Applicant has undertaken to fully assess and mitigate the potential for adverse effects on health as far as is practicable.

Table 7 – Summary of Health and Wellbeing Effects

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
Air Quality	Construction and Decommissioning	Residential offsets within **Design Commitments [EN010158/APP/5.9.3]** Traffic routing secured by the **Outline CTMP [EN010158/APP/7.5.2]**and **Outline DEMP [EN010158/APP/7.4.2]**	Negligible (Dust and particulate emissions; traffic-related emissions)	Measures within the **Outline CEMP [EN010158/APP/7.2.2], Outline CTMP [EN010158/APP/7.5.2]** and the **Outline DEMP [EN010158/APP/7.4.2]**	Negligible to Minor Adverse; Not Significant
	Operational (Including Maintenance)	Residential offsets within **Design Commitments [EN010158/APP/5.9.3]**	Negligible (Traffic-related emissions)	Measures within the **Outline OEMP [EN010158/APP/7.3.2]**	Negligible to Minor Adverse; Not Significant
Noise	Construction and Decommissioning	Maximising separation distance from sensitive receptors secured by the **Works Plans [EN010158/APP/2.3.3]** and the **Design Commitments**	Potential Significant Adverse Effect (Construction activity) No Significant Effect (Construction traffic)	Measures within the **Outline CEMP [EN010158/APP/7.2.2], Outline CTMP [EN010158/APP/7.5.2]** and the **Outline DEMP [EN010158/APP/7.4.2]**	Minor Adverse; Not Significant

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
	Operational (Including Maintenance)	**[EN010158/APP/5.9.3]**; Use of equipment with low noise emissions and orientation of equipment secured by the **Outline CEMP [EN010158/APP/7.2.2]**, **Outline OEMP [EN010158/APP/7.3.2]** and **Outline DEMP [EN010158/APP/7.4.2].**	Potential Significant Adverse Effect (Operational noise levels at night)	Measures within the **Outline OEMP [EN010158/APP/7.3.2]**	Minor Adverse; Not Significant
Landscape and Visual Environment	Construction and Decommissioning	Embedded screening and measures within **Outline CEMP [EN010158/APP/7.2.2]**; **Outline LEMP [EN010158/APP/7.6.2]**; **Outline SMP [EN010158/APP/7.7.2]**; and **Outline DEMP [EN010158/APP/7.4.2]**.	Moderate and Major Adverse Effects (Some PRoW and recreational areas)	Measures within the **Outline CEMP [EN010158/APP/7.2.2]**, **Outline CTMP [EN010158/APP/7.5.2]** and the **Outline DEMP [EN010158/APP/7.4.2]** Measures within the **Outline LEMP [EN010158/APP/7.6.2]** and **Outline RoWaS [EN010158/APP/7.8.2]**	Moderate Adverse; Significant

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
	Operational (Including Maintenance)	Iterative design set out in set out in the **Design Approach Document [EN010158/APP/5.8.2]** and **Outline LEMP [EN010158/APP/7.6.2]**	Moderate and Major Adverse Effects (Some PRoW and recreational areas) No Significant Effect (Residential receptors)	Measures within the **Outline LEMP [EN010158/APP/7.6.2]** and **Outline RoWaS [EN010158/APP/7.8.2]**	Moderate Adverse; Significant
Traffic, Transport and Access	Construction and Decommissioning	Routing requirements set out in the Routing requirements set out in **Outline CTMP [EN010158/APP/7.5.2]**	Potential Adverse (severance, driver delay, pedestrian delay, non-motorised amenity, and fear and intimidation) Slight Adverse (Community access)	Measures within the **Outline CTMP [EN010158/APP/7.5.2]** and **Outline RoWaS [EN010158/APP/7.8.2]**	Minor Adverse; Not Significant
	Operational (Including Maintenance)	Recreational and connectivity-providing permissive paths, as set out within the **Outline RoWAS [EN010158/APP/7.8.2]**, **Streets, Rights of Way and Access Plans**	Negligible (severance, driver delay, pedestrian delay, non-motorised amenity, and fear and intimidation) Neutral to Slight Beneficial (Community access	Measures within the **Outline CTMP [EN010158/APP/7.5.2]** and **Outline RoWaS [EN010158/APP/7.8.2]**	Minor Adverse; Not Significant Minor Beneficial; Not Significant (Improved

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
		[EN010158/APP/2.4.3] and the **Draft DCO [EN010158/APP/3.1.3]**			community access only)
Existing Jobs, Business and Commercial Activity	Construction and Decommissioning – continuing to Operational (Including Maintenance)	Heads of Terms have been agreed for land swaps and/or compensation with all tenants and landowners, and in some cases, agreements have been finalised. Measures secured in the **Design Commitments [EN010158/APP/5.9.3]** relating to the access and movement of livestock within and between fields used for commercial purposes	Slight Adverse (Change in indicative employment and business viability)	Measures within the **Outline CEMP [EN010158/APP/7.2.2]; Outline CTMP [EN010158/APP/7.5.2]**; **Outline LEMP [EN010158/APP/7.6.2]; Outline OEMP [EN010158/APP/7.3.2]**; and **Outline DEMP [EN010158/APP/7.4.2].**	Minor to Moderate Adverse; Not Significant
	Construction and Decommissioning	None	Neutral / Slight Beneficial (Creation of new jobs and skills opportunity in	**Outline Employment, Skills and**	Negligible to Minor Beneficial;

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
New Employment and Skills			construction and decommissioning)	**Supply Chain Plan [EN010158/APP/7.14.2]**	Not Significant
	Operational (Including Maintenance)	None	Neutral / Slight Beneficial (Creation of new jobs and skills opportunity in operation (including maintenance)		Negligible to Minor Beneficial; Not Significant
Social Cohesion	Construction and Decommissioning	None	Negligible to Minor Adverse (Effect of incoming, non-local construction workforce)	Measures relating to community engagement set out in **Outline CEMP [EN010158/APP/7.2.2]; Outline CTMP [EN010158/APP/7.5.2]**; **Outline LEMP [EN010158/APP/7.6.2]; Outline OEMP [EN010158/APP/7.3.2]**; **Outline RoWaS [EN010158/APP/7.8.2];** and **Outline DEMP [EN010158/APP/7.4.2]**	Negligible to Minor Adverse; Not Significant

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
EMF and Radiation	Operational (Including maintenance)	Design and separation measures secured in the **Design Commitments [EN010158/APP/5.9.3]** **Minimum clearance distances secured in the Works Plans [EN010158/APP/2.3.3]**	Negligible (direct and cumulative effects of EMF and radiation)	None	Negligible to Minor Adverse; Not Significant
Major Accidents and Disasters	Operational (Including maintenance)	Design measures informed by the **BESS Plume Assessment Summary [EN010158/APP/7.13.2]**	No Significant Effect (thermal runaway and battery safety)	Measures and protocols within the **Outline BSMP [EN010158/APP/7.9.2]**	Minor Adverse; Not Significant
Land and Water Contamination	Construction and Decommissioning	Design features set out in the **Design Commitments [EN010158/APP/5.9.3], Works Plans [EN010158/APP/2.3.3]** and the **Outline Drainage**	Potential Significant Effect (contamination effects on human health)	Measures within the **Outline CEMP [EN010158/APP/7.2.2]**, **Outline DEMP [EN010158/APP/7.4.2]** and the **Outline Drainage Strategy [EN010158/APP/7.11.2]**	Minor Adverse; Not Significant

Health Determinant	Phase	Embedded Mitigation	Likely Significant Effect (reported in ES, before Additional Mitigation)	Additional Mitigation / Enhancement	Residual Health Effect
		Strategy [EN010158/APP/7.11.2]			
	Operational (Including Maintenance)			Measures within the **Outline OEMP [EN010158/APP/7.3.2],** the **Outline BSMP [EN010158/APP/7.9.2]** and the **Outline Drainage Strategy [EN010158/APP/7.11.2]**	Minor Adverse; Not Significant

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