Appendix I.1

Population and Human Health Statement

Population and Human Health Summary Statement

Bodelwyddan Solar and Energy Storage

Stantec

Prepared for:
Bodelwyddan Solar and Energy Storage Ltd

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1 Introduction

1.1 Background

1.1.1 This Population and Human Health Summary Statement ('Summary Statement') has been prepared by Stantec UK on behalf of Bodelwyddan Solar and Energy Storage Limited in support of a full planning application for the construction, operation, maintenance and decommissioning of a proposed solar photovoltaic (PV) electricity generation system and battery energy storage system ('BESS'), associated solar arrays, inverters, transformers, cabling, substations, access tracks, landscaping and ecological enhancements, fencing/CCTV and associated ancillary development for 40 years (the 'Proposed Development') on land near Bodelwyddan, North Wales (the 'Site', which is shown on the Site Location Plan included in **Appendix A.1** of the Environmental Statement).

1.1.2 An Environmental Impact Assessment (EIA) Scoping Report was submitted to Welsh Ministers with a request for a Scoping Direction on 20 December 2024. An EIA Scoping Direction was received on 28th February 2025 which stated that "*Population and Human Health is therefore scoped into the Environmental Statement (ES), but not as a standalone chapter*." As a standalone ES chapter is not required, this Summary Statement has been prepared in accordance with ISEP guidance (ISEP, 2022) as a proportionate approach to appraising population and human health impacts within the EIA.

1.1.3 This Summary Statement presents a summary of the potential for population and human health effects linked to the bio-physical environmental within the ES including, **Chapter 6 - Flood Risk and Water Resources**, **Chapter 8 - Climate Change**, **Chapter 9 - Ground Conditions and Contaminated Land**, **Chapter 10 - Biodiversity** and **Chapter 11 - Landscape and Visual**.

1.1.4 The following environmental topics have also been considered: Material Assets and Waste (addressed within **Chapter 5 - Construction Methodology and Phasing**); Major Accidents and Disasters (addressed within the Outline Battery Safety Management Plan (oBSMP); Flood Consequence Assessment (FCA) and Drainage Strategy; and the High-Level Electromagnetic Field Assessment.

1.1.5 This Summary Statement is supported by the following appendices:

- **Appendix A:** Public Health Consultation
- **Appendix B:** Local Study Area

2 Policy Context, Legislation, Guidance and Standards

2.1 National Planning Policy

Planning Policy Wales (PPW)

2.1.1 PPW (Welsh Government, February 2024) underlines the significance of undertaking a health impact assessment with a wider determinants of health framework to address health inequalities:

- Paragraph 3.20 states: "*disadvantaged and deprived communities tend to be disproportionately affected by health problems. There are links between the built and natural environment and health throughout a person's lifetime and an understanding of the wider determinants of health should be a key component of development plan preparation. The planning system should identify proactive and preventative measures to reduce health inequalities. This will include enabling opportunities for outdoor activity and recreation, reducing exposure of populations to air and noise pollution, promoting active travel options and seeking environmental and physical improvements, particularly in the built environment."* (p. 29).

- Paragraph 3.24 recommends: *"Where significant effects on human health are likely to arise as a result of development plans or individual development proposals, environmental impacts should be considered in full knowledge of the likely consequences for health [...] where relevant, health impacts should be incorporated into such assessments. [...] Health Impact Assessment makes a valuable contribution towards plan making. It may be useful when proposing or making decisions on new development along with evidence collected by Public Service Boards. Evidence on health impacts can help the planning system develop stronger and more coherent approaches towards maximising health and well-being."* (p. 30).

Well-being of Future Generations Act (Wales) 2015

2.1.2 The Act is about improving the social, economic, environmental and cultural well-being of Wales. The Act gives a legally-binding common purpose for national government, local government, local health boards and other specified public bodies.

2.2 Local Planning Policy

Denbighshire County Council Local Development Plan 2006-2021

2.2.1 This is the current adopted plan, however a replacement Local Development Plan 2018-2033 is currently being developed in line with the latest national policies. Relevant policies within the current plan include Policy VOE 10: Renewable energy technologies.

Conwy and Denbighshire Public Services Board: Well-being Plan 2023 to 2028

2.2.2 This Plan sets out the local objectives that the board will take to improve the economic, social, cultural and environmental well-being for the area. The focus is making Conwy and

Denbighshire a more equal place with less deprivation through four key themes: Well-being; Economy; Equality; and Housing.

2.3 Consultation

2.3.1 Planning and Environment Decisions Wales (PEDW) advised liaison with Officers at Denbighshire County Council and Conwy County Borough Council in order to agree on the scope of this Summary Statement to appropriately address population and human health effects of the Proposed Development. A consultation email was sent to both Councils as shown in **Appendix B.** However, no response was received from either Council.

3 EIA Scoping & Methodology Summary

3.1 Introduction

3.1.1 As stated in Section 1.1.2, an EIA Scoping Direction was received on 28 February 2025 which stated that "*Population and Human Health is therefore scoped into the Environmental Statement (ES), but not as a standalone chapter*." As a standalone ES chapter is not required, this Summary Statement has been prepared in accordance with ISEP guidance (ISEP, 2022) as a proportionate approach to appraising population and human health impacts within the EIA.

3.1.2 The following environmental topic assessments will be summarised within this Summary Statement to provide an overview of any likely significant effects linked to Population and Human Health and any associated mitigation measures: **Chapter 6 - Flood Risk and Water Resources**, **Chapter 8 - Climate Change**, **Chapter 9 - Ground Conditions and Contaminated Land**, **Chapter 10 - Biodiversity**, **Chapter 11 - Landscape and Visual**, Material Assets and Waste (addressed within **Chapter 5 - Construction Methodology and Phasing**), Major Accidents and Disasters (addressed within the oBSMP and FCA and Drainage Strategy) and the High-Level Electromagnetic Field Assessment. These chapters and reports are relevant as they have the potential to affect aspects of health and wellbeing, for example, an increase in air and noise pollution has the potential to negatively affect overall wellbeing.

3.1.3 The ISEP (2022) guidance 'Effectively Scoping of Human Health in EIA' does not recommend solely relying on separate ES technical chapters to provide coverage of human health effects (i.e., disparate discussion of health issues across the ES). As such this Summary Statement has been included as part of the ES to consolidate discussion on the scoped-in topics relating to potentially significant human health effects and any proposed mitigation measures during both construction and operation. This Summary Statement also details intra-project effects and cumulative effects relevant to population and human health, as discussed in **Section 8** of this Summary Statement . Overall, this Summary Statement provides a single summary of all potentially significant population and human health effects for stakeholders, and outlines the Proposed Development's public health implication, any health-related consultation priorities and any effects on health inequalities.

3.1.4 The following environmental topics were scoped out of the ES and therefore have not been included in the assessment, as agreed through the EIA Scoping Direction received on 28 February 2025. The justification for the topics being scoped out in the context of human health are presented below in **Table 3.1**.

Table 3.1: Scoped out Environmental Topics

Scoped Out Environmental Topic	Justification
Transport and Access	The number of vehicle trips generated during the construction, operational and decommissioning phases are likely to have a negligible impact on the local and strategic highway network. In addition, it is considered that the number of vehicle trips generated will not be above the thresholds to define the scope of assessment and therefore would not require assessment. In addition, the impact of the Proposed Development on the local highway network has been adequately addressed through the submission of separate standalone technical reports which accompanies the planning application – including an Outline Construction Traffic Management Plan (OCTMP) / Outline Decommissioning Environmental Management Plan (oDEMP) and a Transport Statement.

Socio-economics	There are not anticipated to be any likely significant effects on socio-economic receptors (e.g. farm businesses, employment, economic output). A standalone Socio-Economic Statement has been prepared to accompany the planning application to report the socio-economic benefits of the Proposed Development.
Noise and Vibration	Potential noise and vibration impacts from the Proposed Development on existing sensitive receptors are considered to be controllable at the design stage for the operational phase and by the use of 'Best Practicable Means' during the construction and decommissioning phases. The effects of noise and vibration from the Proposed Development are therefore not anticipated to be significant.
Air Quality	Given the nature and scale of the Proposed Development, significant effects on the environment with respect to air quality are unlikely.
Wind Microclimate	Likely significant effects on the wind microclimate are not anticipated given that the PV arrays will be no more than 3 m above the ground and not in a location with public access preventing members of the public accessing outdoor amenity space.
Daylight, Sunlight and Overshadowing (including Glint and Glare)	The scale and massing of the Proposed Development will not cause changes to daylight or sunlight availability or cause overshadowing of residents or amenity space. In addition, a Glint and Glare Assessment has been prepared and submitted with the planning application.
Lighting	The Proposed Development is not anticipated to produce a significant lighting impact on the existing character of the night-sky.

4 Baseline Conditions

4.1 Introduction

4.1.1 This section outlines the population and human health characteristics of the communities around the Site, relevant to the assessment topics. The purpose is to gain an understanding of the overall health of the population, identify sensitivities and receptors with the local area that could be affected by the Proposed Development, and in particular any vulnerable groups that may be inequitably affected by the development.

Study Area

4.1.2 A Local Study Area (LSA) (**Appendix C**) has been determined to assess the general population and health baseline for the Proposed Development. The LSA is comprised of four middle layer super output areas (MSOAs):

- W02000031: Conwy 005;
- W02000036: Conwy 010;
- W02000050: Denbighshire 009; and
- W02000051: Denbighshire 010.

4.1.3 District (Denbighshire), district (Conwy) and national (Wales) level data are used, where available, as comparators to contextualise the LSA data.

Baseline Data Collection

4.1.4 The following data sources have been used to inform the baseline conditions, all of which are fully referenced in **Section 10** of this Summary Statement:

- Office for National Statistics (ONS) Census 2021;
- Welsh Index of Multiple Deprivation (WIMD) 2019;
- Digital Health and Care Wales; and
- StatsWales.

Population

4.1.5 This section provides an overview of the demographic and socio-economic characteristics of the LSA, including population size, age distribution, ethnicity, religion, disability prevalence and levels of deprivation. Data within the LSA has been compared against data from Denbighshire and Wales as a whole.

- **Population**: The population in the LSA in 2021 was 31,137, compared to 95,817 in Denbighshire, 114,741 in Conwy and 3,107,493 in Wales (ONS, 2025a).
- **Age**: Within the LSA 15.6% of the population is aged under 15 years which is lower than in Denbighshire (17.6%), Conwy (16.0%) and Wales (17.6%). The LSA has a similar working age population (aged 16-64) (55.3%) to Denbighshire (57.6%) and Conwy

(56.6%). However, all three percentages are lower than the national average (61.1%). The LSA has a higher percentage of people aged 65+ (29.2%) compared to Denbighshire (24.8%), Conwy (27.3%) and national (21.3%) averages (ONS, 2025a).

- **Ethnicity and Religion**: 96.4% of the LSA population identifies as White, which is a similar proportion to Denbighshire (96.5%) and Conwy (96.9%), but higher than the national (93.8%) average. The second largest ethnic group in the LSA is Asian, Asian British or Asian Welsh (2.0%), which is marginally higher than in Denbighshire (1.7%) and Conwy (1.4%), but is lower than the national average (2.9%) (ONS, 2025b). The most common religion in the LSA is Christianity (52.7%), which is higher than the rest of Denbighshire (49.3%), Conwy (50.8%) and Wales (43.6%) (ONS, 2025c).

- **Disability**: In the LSA, 25.3% of the population is disabled under the Equality Act which is slightly higher than in Denbighshire (23.3%), Conwy (22.6%) and Wales (21.6%). Within the LSA, of this 25.3%, 12.3% people's day-to-day activities are limited a lot (ONS, 2025d).

- **Indices of Multiple Deprivation (IMD)**: IMD data for Wales is available at lower super output area (LSOA) level (Welsh Government, 2019). The LSA is located within the following LSOAs and the levels of deprivation are illustrated in **Figure 4.1**:

    - W01000247: Trefnant – Overall, it is ranked amongst the 50% least deprived LSOAs in Wales. Deprivation in this LSOA relates to access to services (10-20% most deprived) and housing (30-50% most deprived).

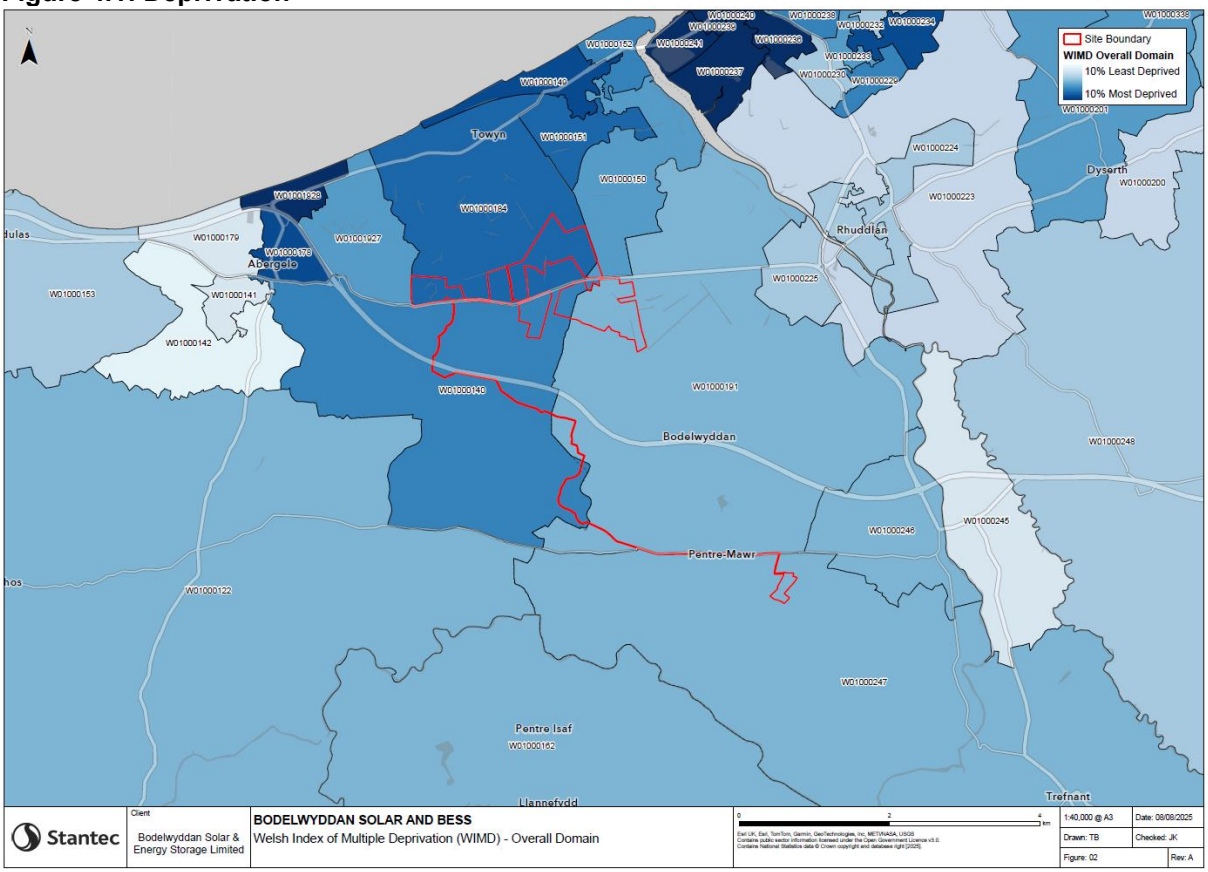
    - W01000191: Bodelwyddan – Overall, it is ranked amongst the 50% least deprived LSOAs in Wales. Deprivation in this LSOA relates to community safety (10-20% most deprived).

    - W01000140: Gele 1 – Overall, it is ranked amongst the 30-50% most deprived LSOAs in Wales. Deprivation in this LSOA relates to income, access to services, community safety, and housing (all 20-30% most deprived).

    - W01000184: Towyn – Overall, it is ranked amongst the 20-30% most deprived LSOAs in Wales. Deprivation in this LSOA relates to health (10-20% most deprived), community safety (10-20% most deprived) and physical environment (10-20% most deprived).

    - W01000150: Kinmel Bay 2 – Overall, it is ranked amongst the 30-50% most deprived LSOAs in Wales. Deprivation in this LSOA relates to access to services (20-30% most deprived) and physical environment (10-20% most deprived).

Figure 4.1: Deprivation



Health Profile

4.1.6 This section provides an overview of the health characteristics of the LSA, including general health statistics, life expectancy, disease prevalence and physical health characteristics. As above, the data within the LSA has been compared against data from Conwy, Denbighshire and Wales as a whole.

- **Self-Assessed General Health**: The LSA population assessed their general health to be slightly lower than the district averages and national average. 74.7% rated their health as either 'good' or 'very good' (Denbighshire: 77.6%; Conwy: 77.9% Wales: 78.6%), while 8.0% rated their health as 'bad' or 'very bad' (Denbighshire: 7.1%; Conwy: 6.6%; Wales: 7.0%) (ONS, 2025e).

- **Life Expectancy**: Average life expectancy[1] at birth in Denbighshire for males in 2021-23 was 77.6 years, which is similar to Conwy (78.7 years) and the national average (78.0 years). Average life expectancy for females in the same period was 80.9 years for Denbighshire, which is slightly lower than for Conwy (82.4 years) and the national average (82.0 years) (Digital Health and Care Wales, 2025).

- **Disease Prevalence and Physical Health Characteristics**: **Table 4.1** below shows that the majority of the physical health baseline standards are worse in Denbighshire than the national averages. However, within Conwy, the physical health baseline standards are on

[1] 3 year average

average similar or better to the national averages, except for musculoskeletal complaints and all cancer death rates.

Table 4.1: Physical Health Baseline Standards

Indicator	Year	Conwy	Denbighshire	Wales
Illnesses (% of adults aged 16+)				
Musculoskeletal complaints	2021-22 & 2022-23	18%	19%	16%
Heart and circulatory complaints	2021-22 & 2022-23	11%	13%	11%
Endocrine and metabolic diseases	2021-22 & 2022-23	8%	11%	8%
Respiratory system complaints	2021-22 & 2022-23	7%	9%	8%
Mental health condition	2021-22 & 2022-23	7%	12%	11%
Mortality				
All Cancers, Death Rates (per 100,000)	2023	279.5	300.1	263.2
Mental and Behaviour, Death Rates (per 100,00)	2023	106.0	121.8	114.1
Dementia/Alzheimer's, Death Rates (per 100,00)	2023	105.4	120.5	111.1
All Cardiovascular Diseases, Death Rates (per 100,00)	2023	249.3	306.8	259.5

Key	
	Better than the Welsh average
	Similar to the Welsh average
	Worse than the Welsh average
	Not compared

Source: Welsh Government (2025a) and Digital Health and Care Wales (2025).

Wider Determinants of Health

4.1.7 This section provides an overview of the wider determinants of health within the LSA relevant to the Proposed Development. The information provided includes data on active travel statistics, physical activity and Public Rights of Ways (PRoWs). As above, the data within the LSA has been compared against data from Conwy, Denbighshire and Wales as a whole.

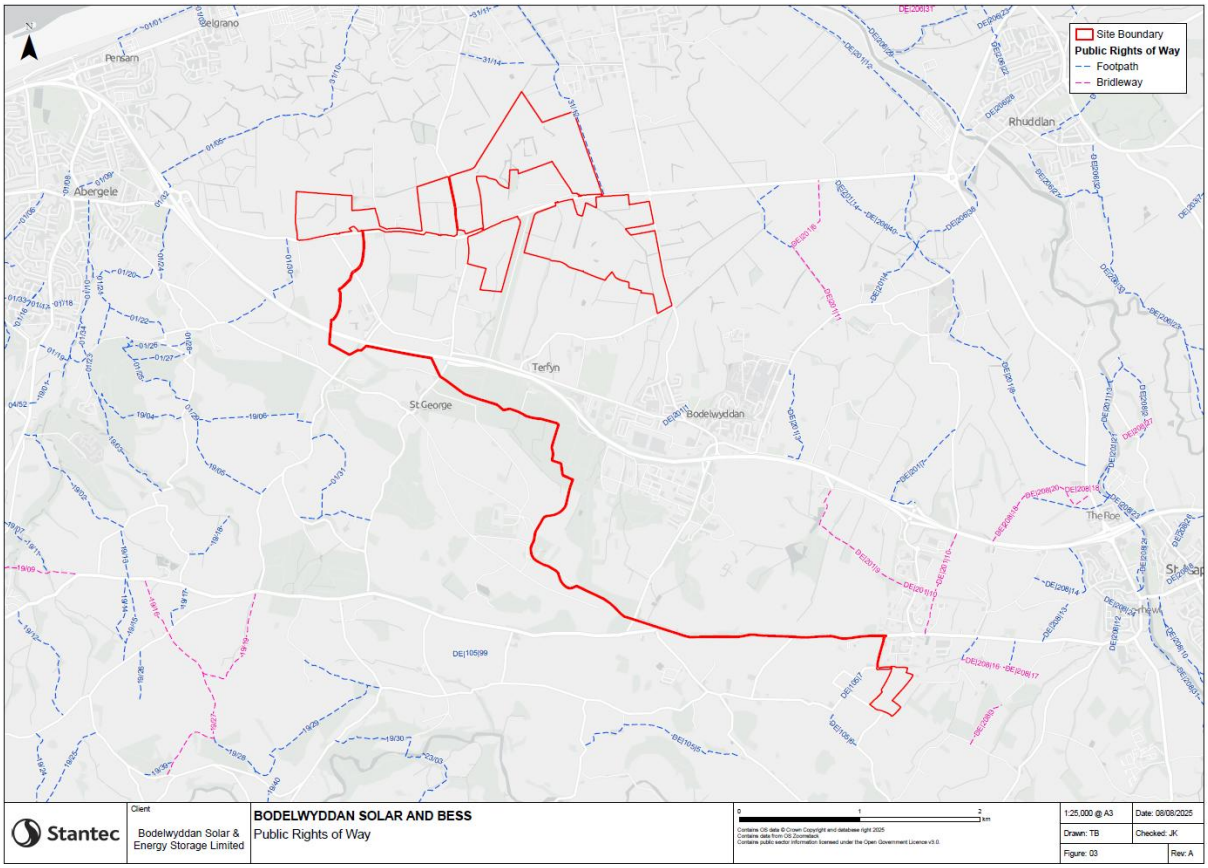
- **Active Travel**: According to the 2021 Census, 1.2% in the LSA used a bicycle to travel to work which is similar to Conwy (1.1%), Denbighshire (1.2%) and Wales (1.1%). However, 6.3% in the LSA travelled on foot to work, which is lower than in Cowy (8.0%), Denbighshire (8.2%) and Wales (7.1%) (ONS, 2025f).

- **Physical Activity**: In 2022/23, 52% of people in Denbighshire got the recommended 150 minutes of exercise in a week, which is slightly lower than the rest of Wales (56%).

However, both averages are much higher than the average in Conwy (37%) (Welsh Government, 2025a).

- **PRoWs**: No PRoWs traverse the Site. The closest lies along the eastern boundary (31/12). **Figure 4.2** shows the PRoWs that are located close to the Site.

Figure 4.2: PRoWs



Baseline Evolution

4.1.8 **Chapter 6 - Flood Risk and Water Resources**, **Chapter 8 - Climate Change**, **Chapter 9 - Ground Conditions and Contaminated Land**, **Chapter 10 - Biodiversity** and **Chapter 11 - Landscape and Visual** of the ES each address the evolution of baseline conditions within their respective chapters. This section summarises key aspects relevant to human health, along with population projections at the local authority, regional and national levels.

Population Projections

4.1.9 Between 2023 and 2043, the population of Denbighshire is projected to grow by 2.8%. Conwy is projected to experience a population growth of 4.1% within the same time period. Both rates of growth are above the North Wales (region) average of 2.2%. However, the national projection for Wales is 4.1% which is higher than Denbighshire but the same as for Conwy (Welsh Government, 2025b).

Flood Risk and Water Resources

4.1.10 As discussed in **Chapter 6 - Flood Risk and Water Resources,** from a flood risk and water quality perspective, the future baseline is assessed against the anticipated lifetime of the Proposed Development, which is 40 years. Fluvial flows would be expected to increase between 40% (upper climate change estimate) or 20% (central estimate) over the lifetime of the Proposed Development. Consequently, the relevant uplift to river flows for the Site would be 20%. As with all areas in Wales, rainfall would increase between 20% (upper estimate) and 10% (central estimate). For Denbighshire the sea level rise estimates for 2100 are 0.75 m for the 70th percentile and 0.95m for the 95th percentile. For 2120 they increase to 0.98 m and 1.29 m respectively.

4.1.11 Modelling undertaken as part of the Chapter shows the Site to be flood free when accounting for the presence of flood defences.

Climate Change

4.1.12 **Chapter 8 - Climate Change** discusses the carbon budgets and interim targets for Wales, including the Carbon Budget 3 (2026-2030), 2030 interim target, etc. These are the next milestones on Wales's pathway to net zero. This pathway is in line with the Welsh Government's Net Zero Strategic Plan.

4.1.13 The UK Government has published the Carbon Budget Delivery Plan (CBDP) (DESNZ, 2023) which sets out detailed proposals to enable the delivery of the fourth, fifth and sixth Carbon Budgets. The CBDP provides indicative projections of sectoral based residual emissions, based on an adjusted version of the Government's Energy and Emissions Projections, which apply assumptions of future economic growth, fossil fuel prices, electricity generation costs, UK population growth and other key variables. **Chapter 8 - Climate Change** sets out the projected emissions for the Power sector, which is considered to be the most relevant to the Proposed Development.

4.1.14 In relation to local emissions, if the Site continues in its current use, there would be ongoing emissions from agricultural uses. The Site would likely sequester carbon at its current rate, although vegetation would mature. Future baseline emissions are considered to remain similar to that of current Site conditions.

4.1.15 In relation to the climate, it is expected that the Proposed Development will experience the following climatic changes:

- An increase in average annual temperature;
- An increase in maximum temperature, particularly in the summer;
- More extreme rainfall events;
- An increase in winter rainfall;
- A reduction in summer rainfall; and
- High winds.

4.1.16 The projected climatic changes outlined above may have a direct impact on the Proposed Development or result in secondary impacts which may impact the performance or integrity of the Proposed Development i.e. a 'climate hazard'. As a result of the projected climatic changes, there is an increased risk of:

- Long term changes to climate norms;
- Heatwaves;
- Low rainfall and drought;
- Heavy rainfall and flooding; and
- Increase in storm intensity.

Ground Conditions and Contaminated Land

4.1.17 As discussed in **Chapter 9 - Ground Conditions and Contaminated Land**, the foreseeable future baseline conditions existing at the Site in 2026 (which is the earliest potential construction start for the Proposed Development), without the implementation of the Proposed Development (or any other development on or in the vicinity of the Site) are unlikely to differ from the conditions identified in 2025.

Biodiversity

4.1.18 As discussed in **Chapter 10 - Biodiversity,** although climate modelling has been undertaken, it is not possible with any confidence to fully predict the effects on the baseline habitats and species from climate change. It is not considered that the species or habitats identified within the Site would be significantly affected by, or vulnerable to, the change in rainfall or temperature changes from climate change as modelled.

4.1.19 Climate induced changes could result in certain floristic species becoming more dominant/prevalent, with potential changes to their phenology or with certain species extending their home ranges. However, given that valued habitats and species are generally widespread, with the Site not at or near the edge of any of their ranges, the projected change in temperatures is not anticipated to result in any significant changes to designated site habitat or species Important Ecological Features (IEFs).

Landscape and Visual

4.1.20 Without the Proposed Development, the site would likely continue under intensive farming with minimal habitat management. This could lead to gradual degradation of field patterns and biodiversity, reducing the site's ability to support protected and priority species.

4.1.21 Climate change may further impact the intensively farmed floodplain through storm damage, drought, and crop failure. Existing signs of degradation, such as poor hedgerows, suggest declining land quality. Future shifts toward wetter conditions could make intensive farming unviable, prompting transitions to wetland-compatible uses, rewilding, or restoration efforts—potentially transforming the landscape into a more ecologically functional area.

4.2 Sensitive Receptors and Vulnerable Groups

4.2.1 The Wales Health Impact Assessment Support Unit (WHIASU, 2020) Population Groups Checklist (which is an accepted source reference for projects across the UK) has been reviewed in order to identify the population groups who could be more impacted than others by the Proposed Development. The following receptor and vulnerable population groups have been identified and are considered within the assessment (**Section 6**):

- Children and young people;

- Older and elderly people;
- Neighbouring residents;
- People with or at risk of pre-existing health conditions; and
- Construction workers;
- Future users of the Site (e.g. workers);
- PRoW users; and
- Those experiencing higher levels of deprivation in relation to access to services (as it places amongst the 10-20% most deprived) and housing (places amongst 30-50% most deprived).

5 Primary and Tertiary Mitigation

5.1 Primary Mitigation

5.1.1 Primary mitigation outlined in the ES during the construction and operational phases relevant to population and human health are presented below in **Table 5.1**. The decommissioning phase is also considered in **Section 5.1.2**.

Table 5.1: Primary Mitigation

Environmental topic	Primary Mitigation	
	Construction	**Operation**
Flood Risk and Water Resources	- Construct, and utilise, permeable access tracks, lay down areas and compounds early in the construction programme; - Limit the need for hydrocarbons, chemicals and pollutants and their storage. Where required, store in accordance with Natural Resources Wales (NRS) Technical Guidance Notes, such as through the use of impermeable bases; - Where land drains are damaged, record and geolocate them for potential restoration to reduce the chance of creating a sediment pathway; - Use of Horizontal Directional Drilling (HDD) or trellising for cable route crossing; - Prioritise the use of, or upgrade, existing crossings over proposing new crossings; A full list of primary mitigation measures relevant to population and human health is provided in **Chapter 6 - Flood Risk and Water Resources** of the ES.	During operation, the Proposed Development would include the below measures to negate negative impacts arising but maximising benefits of the Proposed Development: The transition of arable farmed land to solar farm with year-round grass cover would result in betterment in terms of runoff, soil erosion and therefore sediment entering surface waters; Battery, inverter and storage containers, which are spread across the Site, would be sited on gravel beds 0.3 m deep allowing for distribution of runoff and infiltration into the ground below, minimising the potential increase in surface water runoff. No maintenance access during flooded conditions to maximise the safety of operatives and recognising the remote operation of the Site.
Climate Change (Greenhouse Gases (GHG))[2]	A connection to the National Grid will be used for the temporary office and welfare building supply for the 24 months of construction. Construction will be conducted in accordance with local and national policy to reduce GHG emissions where possible.	**Energy** During operation, the Proposed Development will generate renewable electricity from solar irradiation and export this to the National Grid. BESS is included in the Proposed Development which will store energy for use at peak times and help to reduce the reliance on fossil fuel energy generation sources that are typically used to meet peak demand. The generation of renewable electricity is considered to be primary mitigation as this will contribute to the decarbonisation of the National Grid. **Green Infrastructure** Development of habitats of ecological value within the Site, including woodlands,

[2] Greenhouse Gas. Part 1: GHG Emissions Assessment of Chapter 8: Climate Change.

Environmental topic	Primary Mitigation	
	Construction	**Operation**
		hedgerows and watercourses, will be avoided or minimised, with infrastructure development focused on existing agricultural land. This will help reduce GHG emissions retaining carbon stores in mature vegetation with a and new planting locations which, taken together, will provide greater potential to store carbon than at present.
Climate Change (Climate Change Risk Assessment (CCRA))[3]	**Flood Risk** Climate change is likely to increase pressure on water sources and the frequency and severity of flooding. Construction compounds and stockpiling of materials (if required) will be located outside areas at risk of flooding to reduce the risk of flooding and pollutants entering floodwater. **Ecology and Planting** Habitats and species provide resilience to climate impacts by sequestering carbon dioxide, providing shading and improving air quality. The position of work compounds and storage areas, construction hours and use of artificial lighting will be carefully chosen to reduce impacts.	**Flood Risk** The Proposed Development will be designed to be resilient to management of storm water and extreme rainfall events. Sustainable Drainage System (SuDS) will be incorporated in the Proposed Development to reduce flood risk and control the quality and quantity of surface water runoff conveyed to the local watercourses. **Ecology and Planting** Planting provides resilience in several ways, including sequestering carbon dioxide, providing shade and improving air quality. An ecological mitigation and enhancement area of approximately 10 ha will be provided as part of the Proposed Development. By providing this level of planting and biodiversity, the Proposed Development will be more resilient to changes in the climate. **Infrastructure, Design and Land Stability** The BESS will be equipped with HVAC for cooling to protect the infrastructure from degradation caused by overheating. Solar panels can be protected from extreme wind events through design mechanisms such as wind-resistant mounting systems and choosing specific angles and orientations to reduce potential impacts. Landscaping on Site will additionally reduce the impacts of high wind events on the infrastructure.
Ground Conditions and Contaminated Land	- Layout optimisation of the Proposed Development to avoid sensitive features / receptors, as far as is practicable, such as identified sources of potential contamination. - Layout optimisation of the Proposed Development to locate structures away from areas of potential land instability hazards, as far as is practicable. - Intrusive ground investigations and assessment will be undertaken prior to construction.	Primary mitigation for the operational phase is not proposed. It is noted that the effects of the embedded mitigation may often be realised at the construction phase, e.g., the removal of contaminated soils (if encountered) during construction means that human health receptors during the operational phase will not encounter contamination.

[3] Climate Change Risk Assessment. Part 2: Climate Change Risk Assessment of Chapter 8: Climate Change.

Environmental topic	Primary Mitigation	
	Construction	**Operation**
	- Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks. - The control of earthworks or materials movement (including any re-use of materials) will only be undertaken in accordance with appropriate Environmental Permits and exemptions. - Any temporary dewatering activities during construction will be undertaken in accordance with NRW guidance.	
Material Assets and Waste	As stated in **Chapter 5 - Construction Methodology and Phasing** of the ES, during the construction period, measures will be put in place to minimise waste and opportunities for recycling maximised, including through implementation of the oCEMP. All relevant recycling and waste regulations and policy will be followed at all times. Construction waste will be managed and minimised in line with the Waste Hierarchy. Any non-hazardous waste produced is likely to be primarily packaging and cable off cuts. This waste will be stored in a covered skip and recycled or appropriately disposed. The primary construction materials to be used will include silicon, aggregate, steel, aluminium timber. Associated electrical equipment, such as the inverters/ transformers will be delivered to the Site in containerised form. Where possible, materials and resources used during the construction of the Development will be sourced from the local area. Materials likely to be sourced locally include stone and fencing.	No operational phase primary mitigation measures have been identified.
Biodiversity	The retention and buffering of habitats of value within and adjacent to the Site including the vast majority of hedgerows (with 5m buffer), wet and dry ditches (5m buffer), main running water ditch along northern Solar Site boundary (10 m buffer), adjacent woodland (15 m buffer), other woodland (10m buffer), mature trees (10 m buffer) and the onsite and immediately off-site ponds (30 m buffer). Existing field access points will be used for construction activities and as the	Retained habitats across the Site boundary will change from their current intensively managed state which supports the existing livestock and arable farming businesses, to areas of reduced and sensitive management. Creation of a number of green corridors throughout the Solar Site along various existing underground utilities easements, which will comprise species-rich grassland creation. An Ecological Mitigation and Enhancement Area, totalling approximately 10 ha, has

Environmental topic	Primary Mitigation	
	Construction	**Operation**
	Proposed Development's maintenance access points (with the exception of the creation of one new access to the northern part of the Solar Site required from a highways safety perspective), reducing impacts on habitats of value such as hedgerows and ditches. The provision of suitable buffers (5 m from top of bank) from retained ditches supporting water vole populations within the Site boundary.	been designed within the proposals to provide enhanced habitat for a range of species, particularly targeting overwintering birds and ground nesting farmland birds. This area will provide enhanced year-round foraging and breeding opportunities for the farmland bird assemblage potentially displaced from the Solar Site, and is located immediately to the south of it (parcel no. 6 as shown on the Illustrative Landscape and Ecology Strategy).
Landscape and Visual	An approved Ecological Construction Method Statement (ECMS) will ensure all necessary checks and safeguards are followed during construction. Landscape features will be protected from machinery, and works will be timed to avoid waterlogged conditions, preventing soil compaction and field degradation.	The solar array layout has been adjusted to reduce visual impact, with equipment positioned away from homes and roads and screened by woodland. Development is confined to intensively farmed fields, avoiding sensitive habitats and retaining key landscape features like hedgerows and field breaks. Buffers have been maintained around ditches, hedgerows, and woodland, and existing access points reused to minimise vegetation loss. The landscape strategy includes enhancing ditches and hedgerows and planting new native hedgerows and trees to strengthen the site's Green Infrastructure Network.

Decommissioning

5.1.2 Some of the ES Chapters have considered primary mitigation in terms of decommissioning within their assessments:

- **Chapter 8 - Climate Change**
  - A Decommissioning Environmental Management Plan (DEMP) has been included with the planning application and will present similar measures to the CEMP to encourage use of lower carbon methods. It would not be appropriate to specify such requirements now as the decommissioning environment beyond the 40-year operation period of the Proposed Development is likely to be considerably different to today.
  - At the design stage, materials should be selected to increase recyclability and to minimise the creation of waste, where reasonably practicable. This will be secured through the DEMP.

5.2 Tertiary Mitigation

5.2.1 Tertiary mitigation during construction and operational phases relevant to population and human health are presented below in **Table 5.2**. The decommissioning phase is also considered in **Section 5.2.2**.

Table 5.2: Tertiary Mitigation

Environmental topic	Tertiary Mitigation	
	Construction	**Operation**
Flood Risk and Water Resources	The oCEMP includes measures to mitigate the risk of increased runoff during the construction phase, for example, locate construction compounds outside areas at risk of flooding, wherever possible. The construction will also be supported by a Soil Management Plan (SMP), which details and secures measures to manage soil compaction.	No operational phase tertiary mitigation measures have been identified.
Climate Change (GHG)	A Construction Environmental Management Plan (CEMP) will be submitted alongside the planning application. The CEMP will include mitigation measures covering transport, materials, waste and air quality during construction. Measures that will reduce GHG emissions during construction include, for example, no unnecessary idling of engines, maintenance of plant equipment so that they are operating optimally, and efficient use of materials to reduce waste. The measures included in the CEMP will contribute to the mitigation of GHG emissions by reducing energy consumption and waste/pollutant generation during construction, thereby leading to a lower carbon footprint for the Proposed Development. A Construction Traffic Management Plan (CTMP) will be submitted for the planning application. The CTMP will set out the routing plans for working and deliveries, scheduling and timing of deliveries, and logistics plans. This will help to improve the efficiencies of vehicle movements during operation. As a result, GHG emissions associated with construction traffic will be reduced.	A Landscape and Environmental Management Plan (LEMP) will be submitted with the planning application to manage the planting on Site. The LEMP will ensure that maximum biodiversity benefits are delivered from the planting strategy.
Climate Change (CCRA)	A CEMP will be submitted with the planning application which manages any construction effects on the Environment. In accordance with the CEMP and Ecological Construction Management Plan (ECMS), mitigation measures will be taken to reduce any impacts on habitats and species. Potential flood risk and drainage effects of the construction stage of the Proposed Development are also considered as part of the CEMP. The CEMP will additionally consider health and safety measures to protect workers during events of flooding and climate extremes. As the climate changes, work practices will be managed during construction to be better adapted to weather conditions, including using Personal Protection Equipment (PPE) more frequently. Work practices will be adapted for events such as increased flooding, storms, high wind events and heatwaves. Health and safety of the construction workers for the Proposed Development are considered in the CEMP.	A LEMP will be submitted of the planning application. The LEMP will include consideration of the maintenance / management measures associated with onsite ecological networks and features that are to be retained, enhanced and created within the Proposed Development. This would increase the long-term resilience of habitats and species within the Site and managing areas that may be affected by droughts. Selected species for the proposed planting within the Site should include those tolerant to higher temperatures, drought resistant and need less irrigation. This will increase resilience and reduce pressure on water supply during a drought. As set out in **Chapter 6 - Flood Resources and Water Environment**, a Drainage Strategy will be submitted with

		the planning application to ensure the Proposed Development does not increase flood risk. As above, to protect workers during operation, PPE will be utilised more frequently and work practices will be adapted through mechanisms such as timing maintenance around storms.
Ground Conditions and Contaminated Land	- Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks. - The National Grid Substation will be constructed, operated and maintained by National Grid, who will not permit the substation and external electrical equipment to be built if it will not be safe for and from the environment, in respect of ground conditions. - The ES is supported by an oCEMP. The oCEMP will outline how the construction of the Proposed Development will avoid, minimise, or mitigate effects on the environment and surrounding area and will include measures such as: o Measures to minimise exposure to contaminated soils e.g., by controlling dust generation and the adoption of good hygiene standards will prevent prolonged skin contact, inhalation, and ingestion of soils during construction. - The Construction (Design and Management) Regulations 2015 (CDM) regulate the health, safety and welfare of construction projects and will apply to the Proposed Development. - Occupational health and safety measures e.g., Personal Protective Equipment (PPE). - A protocol for dealing within any unexpected contamination will be developed by the Contractor and will include A full list of tertiary mitigation measures relevant to population and human health is provided in **Chapter 9 - Ground Conditions and Contaminated Land**.	Tertiary mitigation for the operational phase is not proposed. It is noted that the effects of the embedded mitigation may often be realised at the construction phase, e.g., the removal of contaminated soils during construction means that human health receptors during the operational phase will not encounter contamination.
Material Assets and Waste	Refer to **Table 5.1** for Embedded Mitigation measures.	Refer to **Table 5.1** for Embedded Mitigation measures.
Biodiversity	The retention of non-statutory designations, habitats and species interests, protected from construction impacts through the delivery of measures set out in a Construction Environmental Management Plan (CEMP) and Ecological Construction Management Plan (ECMS), to be secured by planning condition. To inform these documents, an oCEMP and outline ECMS (oECMS) have been submitted with the application. In general, the CEMP and ECMS will include mechanisms to deliver the sensitive siting of work compound(s) and storage areas, including the storage of any fuel, chemicals, plant or machinery, sensitive clearance of vegetation, prevention of pollution events, construction hours and the use of artificial lighting (including security lighting). A	Lighting is not required within the Solar Site, but motion sensing security lighting will be provided at the BESS Site within substations and within the BESS, to be used only for maintenance and security purposes. Where this lighting is required, a sensitive lighting strategy will be implemented to avoid light spill on any retained habitats used by light-sensitive species such as bats;

	timetable of all key tasks to be undertaken as part of pre-construction and construction work will also be provided, taking into account all species and habitat sensitivities.	To deliver net benefits for biodiversity and compliance with the requirements of Planning Policy Wales (PPW), mitigation measures in respect of new habitat creation/enhancement combined with prescriptions for their sensitive long-term management to enable continued functionality of the Site for wildlife will be embedded within a LEMP, to be secured as a condition of any planning consent. To inform this document, an oLEMP has been submitted with the application.
Landscape and Visual	British Standards relating to fencing, tree protection, new tree and hedgerow planting will be adhered to during construction.	In line with PPW Edition 12, the Proposed Development includes replacement tree planting and biodiversity enhancements. Long-term habitat management will ensure ecological benefits are maintained. An oLEMP is submitted, with a detailed LEMP to follow, setting out planting schedules and grassland enhancement methods.
Electromagnetic Field	Various sources of information relating to safe exposure levels to magnetic fields have been reviewed as part of the High-Level Electromagnetic Field assessment, including: - The UK Policy on public exposure limits to Electric and Magnetic Field (EMF) radiation is designed to comply with the 1998 ICNIRP (International Commission on the Non-Ionizing Radiation Protection) guidelines in terms of the 1999 EU Recommendation. In 2010 ICNIRP produced new guidelines but these have not yet been incorporated into UK Policy. The public exposure limits in UK policy define reference levels for electric and magnetic fields. Where field levels exceed these reference levels in significantly occupied spaces, further investigation is warranted. - Another relevant resource consulted is the EMFs.info webpage, where the UK electricity industry have collected the relevant studies pertaining to safe limits on exposure in the UK and elsewhere in the world.	

Decommissioning

5.2.2 Some of the ES Chapters have considered tertiary mitigation in terms of decommissioning within their assessments:

- **Chapter 5 - Construction Methodology and Phasing**
    - Following the operational period of 40 years, the Proposed Development will be decommissioned, and the Site returned to its current agricultural use.
    - All solar array and BESS infrastructure including modules, mounting structures, cabling, inverters and transformers would be removed and, materials reused, recycled or disposed of in accordance with good practice and the legislative requirements in place at that time. The future of the electrical compound including the substation would be discussed with the distribution network operator and agreed with the landowner, Denbighshire County Council (DCC) and Conwy County Borough Council (CCBC) prior to commencement of decommissioning.
    - These works would be undertaken according to legislation, regulations and best practice that are current at the time of decommissioning.

- An oDEMP (**Appendix A.6** of the ES) will be prepared to establish that decommissioning is undertaken in accordance with prevailing good practice at the time. A detailed DEMP will be secured via planning condition prior to the commencement of the Development. The DEMP will include similar measures to those included in the CEMP submitted with the Application.

- In addition, the oDEMP will include details of ecological survey(s) to be undertaken prior to the commencement of decommissioning works to inform potential sources of impacts and necessary mitigation/compensation required to ensure legal compliance.

- **Chapter 10 - Biodiversity**

  - The use of existing access routes and infrastructure to decommission the Site without additional higher value habitat impacts being required;

  - Requirement for compliance with wildlife legislation, including the protection afforded to birds, bat, reptiles and amphibians under the Wildlife and Countryside Act 1981 (as amended). This will include sensitively timed and completed dismantling of equipment so as not to harm protected species interests and supervision by an appointed Ecological Clerk of Works (ECoW) as required;

  - There may be protected species licencing requirements, subject to future survey, particularly with respect to Great Crested Newt (GCN), owing to the creation of higher value terrestrial and breeding habitats within the Solar Site;

  - An ECMS would be provided at this time detailing how protected species are safeguarded and including setting out measures to protect retained habitats. This document will also set out sensitive timing and methodologies of works located within the teal disturbance zone around the wet ditches, to avoid disturbance impacts on the local teal population.

6 Assessment of Likely Significant Effects

6.1.1 **Table 6.1** summarises the potential significant effects on the identified population and human health receptors within the Proposed Development, as outlined within **Chapter 6 - Flood Risk and Water Resources, Chapter 8 - Climate Change, Chapter 9 - Ground Conditions and Contaminated Land, Chapter 10 - Biodiversity, Chapter 11 - Landscape and Visual** of the ES. The following environmental topics have also been considered: Material Assets and Waste (addressed within **Chapter 5:-Construction Methodology and Phasing**) and Major Accidents and Disasters (addressed within the oBSMP and FCA and Drainage Strategy). The High-Level Electromagnetic Field Assessment has also been considered.

Table 6.1: Assessment of Significant Likely Effects

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
Construction					
Flood Risk and Water Resources	- Existing and neighbouring residents - Construction workers	Surface Water: Risk of increased runoff and soil erosion as a result of construction activities, notably soil compaction.	Temporary	- oCEMP - SMP	Negligible
	- Existing and neighbouring residents - Construction workers	Groundwater: Impact on the water environment from spills or accidents.	Temporary		Negligible
Climate Change (GHG)	- Existing and neighbouring residents - Construction workers	Global climate: GHG Emissions	Temporary	- Connection to the National Grid. - CEMP - CTMP	Moderate Adverse (Significant)
Climate Change (CCRA)	- Construction workers	Climate hazards, from heatwaves or periods of heavy precipitation.	Temporary	- CEMP and managing work practices to be better adapted to weather conditions	Negligible
Ground conditions and Contaminated Land	- Construction workers	From the identified on-Site Sources of Potential Contamination (SPCs) during construction.	Temporary	- Measures set out in **Table 5.1** and **Table 5.2**. - oCEMP	Minor Adverse
	- Existing and neighbouring residents	Pre-existing contamination originating within the Site	Temporary		Minor Adverse
Biodiversity	- Children and young people - Older and elderly people	International Statutory Designated Sites	Temporary	- CEMP - ECMS	Negligible (Not Significant)
		Non-Statutory Designated Sites	Temporary		Negligible (Not Significant)

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
	- Existing and neighbouring residents - People with or at risk of pre-existing health conditions - Construction workers - Those experiencing higher levels of deprivation - PRoW users	Habitats	Temporary		Negligible (Not Significant)
		Species	Temporary / Permanent		Negligible (Not Significant)
Landscape and Visual	- Existing and neighbouring residents - Recreational PRoW users	Construction will cause temporary visual changes due to equipment and activity, including a 10m working corridor for cabling—typically confined to 2m and reinstated after use. Hedgerows and trees will be protected, with trenchless methods used in sensitive areas. Mitigation includes screening with existing vegetation, protective fencing, and habitat enhancement through the Landscape and Ecology Management Plan (LEMP). Temporary visual impacts are expected from nearby roads and public rights of way but will be limited to the construction phase.	Temporary	- ECMS - British Standards relating to fencing, tree protection, new tree and hedgerow planting etc. will be adhered to during construction.	Major/moderate – moderate adverse Significant
Material Assets and Waste	- Construction workers - Existing and neighbouring residents	As stated in **Chapter 5: Construction Methodology and Phasing**, during the construction period, measures will be put in place to minimise waste and opportunities for recycling maximised, including through implementation of the CEMP. All relevant recycling and waste regulations and policy will be followed at all times. Construction waste will be managed and minimised in line with the Waste Hierarchy. Any non-hazardous waste produced is likely to be primarily packaging and cable off cuts. This waste will be stored in a covered skip and recycled or appropriately disposed. The primary construction materials to be used will include silicon, aggregate, steel, aluminium timber. Associated electrical equipment, such as the inverters/ transformers will be delivered to the Site in containerised form. Where possible, materials and resources used during the construction of the Development will be sourced from the local area. Materials likely to be sourced locally include stone and fencing.			
Major Accidents and Disasters	- Construction workers - Existing and neighbouring residents	An oBSMP has been submitted alongside the planning application which presents safety controls and good practice to minimise major accidents and disasters (e.g. fires).			

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
		Prior to construction of the BESS, Emergency Plans and Risk Assessment will be developed that will outline how the operator will respond to incident and accident scenarios at site. This will include the interfaces with external first responder organisations. An onsite fire containment strategy will be incorporated into the overall site drainage design at the detailed design stage. During construction, the Site will be secured with temporary fencing, Closed Circuit Television (CCTV) and in-person security. Design safety measures relating to the BESS relevant to human health receptors include: - Site security and monitoring; - The ability for 24/7 Remote Monitoring and Control and automated shut-down - Off-gas detection to allow for preventative interaction. - Battery chemistry bespoke Fire Detection and Suppression Systems (FDSS) fitted to containers. - At a site and installation level: o The landscaping of land adjacent to and between BESS containers and maintenance of vegetation to provide a natural firebreak. o The provision of suitable and sufficient access / passing points for emergency services. o Communication with local emergency services and the provision of site maps, detailing BESS locations, access points and water sources.			
Operation					
Flood Risk and Water Resources	- Existing and neighbouring residents - Future users of the Site (e.g. workers) - PRoW users	Flooding to panels during the design event	Long-term	- Battery, inverter and storage containers. - No maintenance access.	Minor Significance (Not Significant)
		Flooding to containerised infrastructure during residual or exceedance events	Long-term		Minor Significance (Not Significant)
		Risk to the water environment from a battery fire	Long-term		Negligible
Climate Change (GHG)	- Existing and neighbouring residents - Future users of the Site (e.g., workers) - Children and young people - Older and elderly people - People with or at risk of pre-existing health conditions	Global climate: GHG Emissions	Permanent	- LEMP	Negligible
		Long term changes to climate norms	Permanent	- LEMP	Negligible

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
Climate Change (CCRA)	- Future users of the Site (e.g. workers) - Children and young people - Older and elderly people - People with or at risk of pre-existing health conditions	Heatwaves	Permanent	- Managing work practices to be better adapted to weather conditions - Design measures to minimise climate change effects on infrastructure	Minor Adverse
		Low rainfall and drought	Permanent		Negligible
		Heavy rainfall and flooding	Permanent		Negligible
Ground Conditions and Contaminated Land	- Future users of the Site (e.g. workers)	From the identified on-Site SPCs during operation.	Temporary	N/A	Negligible
	- Existing and neighbouring residents	From the identified on-Site SPCs during operation	Temporary	N/A	Negligible
Biodiversity	- Children and young people - Older and elderly people - Existing and neighbouring residents - People with or at risk of pre-existing health conditions - Those experiencing higher levels of deprivation - Future users of the Site (e.g. workers) - PRoW users	Statutory Designated Sites	Long-term	- LEMP - Ecology Mitigation and Enhancement Area	Not Significant
		Non-Statutory Designated Sites	Long-term		Not Significant
		Habitats	Long-term		Not Significant
		Habitats: Coastal Floodplain and Grazing Marsh, Hedgerows, Trees, Wet Ditches, Grassland and Pond.	Long-term		Beneficial (Significant)
		Species	Long-term		Not Significant
Landscape and Visual	- Existing and neighbouring residents - Recreational PRoW users	In Year 1, significant visual effects are expected within 600m of the site, especially from public rights of way and roads, due to the visibility of the development before mitigation matures. Some receptors between 600m and 1.5km may also experience notable effects. Beyond this range, impacts are minimal due to distance, screening, and the low height of the development.	Long-term	- Design and layout of solar array - Retaining of hedgerows, limited land take, avoidance of high-value habitats and ecological corridors - oLEMP and detailed LEMP to follow	Minor adverse to negligible Not Significant

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
		Visual effects are moderate to minor or negligible, and not significant in EIA terms. Although some receptors may be highly sensitive, the changes are barely perceptible and do not alter the view or landscape character. Professional judgement confirms these effects are not significant.			
Major Accidents and Disasters	- Existing and neighbouring residents	During operation, a palisade fence and security cameras will be in place that are remotely monitored 24/7 to ensure security of the Site. The Detailed BSMP (DBSMP) will be produced post planning consent and will build upon the oBSMP to reflect the maturity of the Proposed Development and will: - Assess the level of residual risk posed by the BESS design to individuals (both those directly involved in the operation and 3rd parties), the immediate environment, the asset (i.e. the BESS), interfacing / interdependent assets and property / equipment that could be affected by the operation of the BESS (noise, radiated emissions etc.). - Contain the Emergency Response and Contingency Plans.			
Electromagnetic Field	- Children and young people - Older and elderly people - Existing and neighbouring residents - People with or at risk of pre-existing health conditions - Those experiencing higher levels of deprivation - Future users of the Site (e.g. workers) - PRoW users	33kV to 400kV Underground Cables: The maximum magnetic field produced by the proposed underground cables exceed the exposure reference level (the 100 micro-Tesla public exposure reference level[4]). For users of PRoWs, any radiation effects are expected to be minimal due to their transient exposure as these are not continually occupied, rather they are moving receptors, as opposed to residential dwellings and workplaces.		As the maximum magnetic field produced by the proposed underground cables exceeds the 100 micro-Tesla public exposure reference level, a 5m clearance distance is recommended for these sections. The closest identified dwellings and workspaces to the cable route are located further than this at over 50m away, which is a safe distance, given that electromagnetic field strength decreases	Not Significant

[4] National Grid (n.d.) Available at: https://www.nationalgrid.com/document/341896/download

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
				exponentially with distance.	
		Transformers, and PV Inverters: Notable sources of radiation other than the cables will be the conversion units (transformers/PV inverters) positioned across the proposed development. The transformers and PV inverters are also predicted to produce fields at a lower level than that of underground cables because the equipment is typically housed in protective enclosures. Therefore, no significant impacts associated with the proposed conversion units are predicted.		N/A	Not Significant
		Substations and BESS: The Proposed Development will connect to Bodelwyddan Substation (an existing National Grid distribution substation). According to UK regulation, the substation conforms with the applicable exposure limitations for the general public, and the field from the equipment inside a substation does not extend far, if at all, outside the perimeter fence. Additionally, the Proposed Development will include connection to up to one substation. Electrical equipment associated with these substations are expected to be 'CE' or 'UKCA' marked and housed in protective enclosures and thus predicted to produce fields at a lower level than that of underground cables. Additionally, the proposed substation is more than 100m from any identified dwelling and complies with public exposure limits, as electromagnetic fields from the equipment do not extend significantly beyond the perimeter fence. The BESS contributes to the electromagnetic radiation produced by the Proposed Development. The site for the BESS is adjacent to Bodelwyddan Substation. The proposed BESS locations are situated more than 50m from any identified dwelling or workspace. As electromagnetic radiation levels reduce with increased distance, all nearby dwellings and workplaces are expected to be situated at a safe distance from the BESS installations.		N/A	Not Significant

Topic	Human Health Receptor	Description of Effect	Duration of Effect	Primary and Tertiary (Embedded) Mitigation Measures	Likely Significant Effect
Decommissioning					
Climate Change (GHG)	- Existing and neighbouring residents - PRoW users	Global climate: GHG Emissions	Permanent	N/A	Negligible
Ground Conditions	- Future users of the Site (e.g. workers)	From the identified on-Site SPCs during the decommissioning phase	Temporary	N/A	Minor Adverse
	- Existing and neighbouring residents	From the identified on-Site SPCs during the decommissioning phase	Temporary	N/A	Minor Adverse
Biodiversity	- Children and young people - Older and elderly people - Existing and neighbouring residents - People with or at risk of pre-existing health conditions - Those experiencing higher levels of deprivation - Future users of the Site (e.g. workers) - PRoW users	Statutory Designated Sites	Long-term	Given the creation and management of new and higher value habitats on-Site, this will need to be informed by up-to-date surveys. Where required, licencing should be sought to comply with wildlife legislation.	Negligible
		Non-Statutory Designated Sites and Habitats	Long-term		Not Significant
		Species	Long-term		Negligible
Major Accidents and Disasters	- Existing and neighbouring residents	Disposal activities will be considered at the procurement contract stage and will be included within the BESS safety management process and detailed in the DBSMP. As the programme matures the hazard log will be expanded to cover each phase of product development and installation. It is assumed that all components replaced during the defects notification and warranty period will be returned to the manufacturer and recycled. The BESS development will be subject to a decommissioning plan for submission to the Local Authority on request.			

7 Secondary Mitigation and Enhancement

7.1.1 Secondary mitigation and enhancement during the construction and operational phases relevant to human health are presented below in **Table 7.1**. The decommissioning phase is also considered in **Section 7.1.2**.

Table 7.1: Secondary Mitigation and Enhancement

Environmental topic	Secondary Mitigation and Enhancement	
	Construction	**Operation**
Flood Risk and Water Resources	No significant adverse construction effects are anticipated, and no secondary mitigation measures have been identified.	No significant adverse operational effects are anticipated, and no secondary mitigation measures have been identified. Secondary mitigation could be considered during the detailed design.
Climate Change (GHG)	A CEMP will be prepared prior to the commencement of construction works at the Site and is anticipated to be secured via planning condition. The CEMP will include mitigation measures covering transport, materials, waste and air quality during construction. Measures that will reduce GHG emissions during construction include, for example, no unnecessary idling of engines. The CTMP, submitted as part of this application, sets out the routing plans for working and deliveries, scheduling and timing of deliveries, and site operations. This will help to improve the efficiencies of vehicle movements during operation and in turn, reduce GHG emissions associated with construction traffic.	No significant adverse operational effects are anticipated, and no secondary mitigation measures have been identified.
Climate Change (CCRA)	A Landscape Environmental Management Plan (LEMP) will be submitted of the planning application. The LEMP will include consideration of the maintenance / management measures associated with onsite ecological networks and features that are to be retained, enhanced and created within the Proposed Development. This would increase the long-term resilience of habitats and species within the Site and managing areas that may be affected by droughts. Selected species for the proposed planting within the Site should include those tolerant to higher temperatures, drought resistant and need less irrigation. This will increase resilience and reduce pressure on water supply during a drought. As set out in **Chapter 6 - Flood Resources and Water Environment** of the ES, a Drainage Strategy will be	No significant adverse operational effects are anticipated, and no secondary mitigation measures have been identified.

	submitted with the planning application to ensure the Proposed Development does not increase flood risk.	
Ground Conditions and Contaminated Land	No significant adverse construction effects are anticipated, and no secondary mitigation measures have been identified.	No significant adverse operational effects are anticipated, and no secondary mitigation measures have been identified.
Biodiversity	No significant adverse construction effects are anticipated, and no secondary mitigation measures have been identified.	No significant adverse operational effects are anticipated, and no secondary mitigation measures have been identified.
Electromagnetic Field	No significant adverse construction or operational effects are anticipated, and no secondary mitigation measures have been identified. However, a 5m clearance distance is recommended for the underground cable sections. The closest identified dwellings and workspaces to the cable route are located further than this at over 50m away, which is a safe distance, given that electromagnetic field strength decreases exponentially with distance.	

Decommissioning

7.1.2 Some of the ES Chapters have considered secondary mitigation and enhancement in terms of decommissioning within their assessments:

- **Chapter 10 - Biodiversity**
    - The same principles will apply as per construction mitigation i.e. provision of an ECMS/oCEMP to safeguard designated site, habitat and protected species interests during decommissioning. Given the creation and management of new and higher value habitats on-Site, this will need to be informed by up-to-date surveys, particularly with respect to protected species such as badger, water vole and great crested newt. Where required, licencing should be sought to comply with wildlife legislation.

8 Residual Effects, Cumulative Effects and Monitoring

8.1.1 Residual effects during the construction and operational phases relevant to population and human health are outlined below in **Table 8.1**. The decommissioning phase is also considered in **Section 8.1.2**.

Table 8.1: Residual Effects

Environmental Topic	Residual Effects	
	Construction	**Operation**
Flood Risk and Water Resources	No significant residual effects have been assessed.	No significant residual effects have been assessed.
Climate Change (GHG)	No significant residual effects have been assessed.	The Proposed Development aids in reducing the National Grid average emissions, thus making the Proposed Development in line with the Welsh Government's net zero trajectory. There is potential for a **Beneficial** and **Significant** effect.
Climate Change (CCRA)	No significant residual effects have been assessed.	No significant residual effects have been assessed.
Ground Conditions and Contaminated Land	No significant residual effects have been assessed.	No significant residual effects have been assessed.
Biodiversity	No significant residual effects have been assessed.	The enhancement of retained habitats and creation of new habitats, and their long-term management, is predicted to result in a **Significant** long-term and reversible positive effect at the **Local level** for habitats including coastal floodplain and grazing marsh, hedgerows, trees, wet ditches, grassland and the on-Site pond. No significant residual effects have been assessed.
Landscape and Visual	No significant residual effects have been assessed.	No significant residual effects have been assessed.
Electromagnetic Field	No significant residual effects have been assessed.	No significant residual effects have been assessed.

Decommissioning

8.1.2 Some of the ES Chapters have assessed residual effects in terms of decommissioning within their assessments:

- **Chapter 10 Biodiversity**
    - All decommissioning works would take into account the important IEFs and works will be carried out in accordance with their individual requirements to avoid significant impacts. Those avoidance and mitigation measures set out for

construction work (as set out in a CEMP/ECMS) will also apply to decommissioning.

- Subject to the mitigation measures being implemented, no significant residual effects are anticipated on any designated site, habitat or species during decommissioning. However, a degree of uncertainty is applied with respect to species, as this will be subject to the successful colonisation of the grassland on-site by certain protected species during the lifetime of the development (e.g. reptiles or GCN) and the extent of reversion back to arable land.

- A long-term and reversible negative effect at the Site level, and therefore **Not Significant**, is anticipated for the two non-statutory designations within the Solar Site and the on-Site habitats, due to cessation of the sensitive management delivered through the LEMP and reversion to agricultural land.

- **Chapter 12 Landscape and Visual**

  - Decommissioning will involve removing infrastructure with activity similar to construction, though less intense. Landscape enhancements will remain, and impacts, mainly localised noise, will be minor. The site will retain its improved ecological value and return to agricultural use.

8.2 Cumulative Effects

8.2.1 There are no significant cumulative effects expected in relation to population and human health.

8.3 Monitoring

8.3.1 **Chapter 6 - Flood Risk and Water Resources** did not identify any significant effects that would warrant monitoring. However, it recommends that the Flood Emergency Plan is reviewed every three years or following a practice, drill or flood event that identifies required improvements. The review of the document should utilise the best available flood risk information at the time to ensure the plan keeps pace with climate change.

8.3.2 **Chapter 10 - Biodiversity** It is anticipated that the LEMP would set out the monitoring regime for the enhanced and newly created habitats in order to achieve net benefits for biodiversity and compliance with the requirements of PPW. It is anticipated that this would entail monitoring of all habitats annually in years 1 to 5 and then at years 10,20 and 30 thereafter in line with a review of the LEMP following establishment at year five. The monitoring would inform the need for remedial action. Any significant changes to the LEMP made as a result of the monitoring would be reported to the local planning authority to demonstrate continued compliance and the successful delivery of net benefits for biodiversity.

8.3.3 **Chapter 9 - Ground Conditions and Contaminated Land** did not identify any significant residual adverse effects and therefore no additional long-term monitoring has been proposed.

9 Conclusion

9.1.1 This Population and Human Health Summary Statement has been prepared to present a summary of the potential for population and human health effects linked to the bio-physical environment within this ES including, **Chapter 6 - Flood Risk and Water Resources, Chapter 8 - Climate Change, Chapter 9 - Ground Conditions and Contaminated Land, Chapter 10 - Biodiversity** and **Chapter 11 - Landscape and Visual**.

9.1.2 The following environmental topics have also been considered: Material Assets and Waste (addressed within **Chapter 5 - Construction Methodology and Phasing**) and Major Accidents and Disasters (addressed within the Outline Battery Safety Management Plan (oBSMP) and FCA and Drainage Strategy).

9.1.3 The UK Policy on public exposure limits to Electromagnetic Fields radiation is designed to comply with the 1998 ICNIRP (International Commission on the Non-Ionizing Radiation Protection) guidelines in terms of the 1999 EU Recommendation. In 2010, the ICNIRP produced new guidelines but these have not yet been incorporated into UK Policy. The public exposure limits in UK policy define reference levels for electric and magnetic fields. Where field levels exceed these reference levels in significantly occupied spaces, further investigation is warranted. Further information can be found in the **High-Level Electromagnetic Field Assessment** submitted alongside the ES.

9.1.4 Population and Human Health was scoped out of the EIA. As a standalone ES chapter is not required, this Human Health Summary Statement has been prepared in accordance with ISEP guidance (ISEP, 2022) as a proportionate approach to incorporating population and human health within the scope.

9.1.5 A review of baseline conditions within a Study Area has been presented in relation to population, health overview, wider determinants of health and baseline evolution. From this review, a list of sensitive receptors and vulnerable groups has been presented and incorporated into the summary of population and human health effects.

Construction Effects

9.1.6 Following implementation of further mitigation measures, it is considered that the Proposed Development will have a **Moderate Adverse** and **Significant effect** on the Global Climate GHG emissions, as discussed in **Chapter - 8 Climate Change** during construction.

9.1.7 No other significant construction effects were identified in relation to population and human health receptors.

Operational Effects

9.1.8 As assessed within **Chapter 10 - Biodiversity,** the enhancement of retained habitats and creation of new habitats, and their long-term management, is predicted to result in a **Significant** long-term and reversible positive effect at the **Local Level** for habitats including coastal floodplain and grazing marsh, hedgerows, trees, wet ditches, grassland and the on-Site pond.

9.1.9 No other significant operation effects were identified in relation to population and human health receptors.

Decommissioning Effects

9.1.10 No significant decommissioning effects were identified in relation to population and human health receptors.

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Appendix A Public Health Consultation

Appendix B Local Study Area

With every community, we redefine what's possible.

Stantec is a global leader in sustainable architecture, engineering, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.