11 SUMMARY

11.1 INTRODUCTION

11.1.1This chapter of the ES provides a summary of the various technical assessments which have been undertaken as part of the EIA process.

11.2 LANDSCAPE AND VISUAL

Introduction

11.2.1An assessment of the Proposed Development upon the receiving environment: landscape elements associated with the Application Site, published County and District landscape character units, landscape designations, and visual receptors has been undertaken.

Assessment Approach

11.2.2The assessment has been carried out with regards to the appropriate guidance. Photographs and site visit were carried out in February 2020, these winter views provide a worst-case baseline view when vegetation is out of leaf, providing maximum visibility. Where relevant this has been taken into account during the assessment of potential effects.

Baseline Conditions

11.2.3The site visit helped to ascertain the condition of the landscape elements associated with the Application Site, and level of inter-visibility with the surrounding landscapes and potential visual receptors.

11.2.4Planning policies and published landscape character assessments descriptions for the relevant areas have been reviewed.

11.2.5The site is located within an area of gently undulating agricultural landscape, interspersed with numerous villages; agricultural land with hedgerow boundaries, set within the floodplains of the River Elwy and River Clwyd.

11.2.6The Site is not located within any statutory or local/non-statutory landscape designations with the Clwydian Range and Dee Valley AONB located approx. 3.6km at its closets point to the east. Long distance views from within the Clwydian Range and Dee Valley AONB are available from roads, PRoW footpaths and bridleways, and the open access land which covers the Y Foel hill, to the south of Dyserth.

Assessment of Likely Significant Effects

Construction Phase

11.2.7The Proposed Development would include extensive hedgerow and tree planting, partly to mitigate the potential visual effects but also to enhance the landscape framework across the Site. In terms of direct change to the fabric of the Site the proposed planting would result in major beneficial effects upon the

tree resource and moderate beneficial effects upon the hedgerow resource within the Application Site. These are judged to be significant.

11.2.8Due to the characteristics of the Proposed Development, effects on the landscape character, the AONB landscape, and visual receptors, have not been considered separately for the construction stage. Any potential effects are likely to be similar or lower than those experienced during the operational phase of the Proposed Development.

Operational Phase

11.2.9None of the aspect areas, including the host aspect areas, have been assessed as subject to significant effects. Any potential landscape character effects upon the NLCA 08: North Wales Coast and NLCA 11: Vale of Clwyd would not be significant.

11.2.10 The Clwydian Range and Dee Valley AONB has been assessed as not experiencing any significant effects.

11.2.11 With regards to viewpoint assessment only two out of nine identified viewpoints which have been assessed are subject to significant effects (Viewpoint 1 and Viewpoint 2). Both viewpoints are located within the Site. The proposed mitigation measures are likely to reduce the visibility of the solar panels and the associated infrastructure, but unlikely to mitigate against significant visual effects.

11.2.12 In terms of visual receptors, none of those located within the surrounding landscape have been considered to be subject to significant visual effects. Receptors travelling along the PRoWs that cross the Site would experience locally some significant visual effects due to proximity and direct nature of views.

11.2.13 At Year 1 it is likely that significant visual effects would occur at the properties associated with Gwernigron Farm House, Plas Coch, Wern Bach, and the properties overlooking the south eastern corner of the Proposed Development. Once the proposed mitigation measures have matured, however, it is predicted that the proposed hedgerow and tree planting would mitigate against these significant effects.

Mitigation and Enhancement

11.2.14 A number of mitigation measures have been implemented during the iterative design stage and these relate to the protection of boundary vegetation, location and alignment of access tracks, location of ancillary infrastructure such as substations and transformers but also the location of the construction compound.

11.2.15 Positive management of existing hedgerows and new hedgerow tree planting has been included to reduce the visual effects and reduce the potential change upon the landscape character and visual amenity of the nearby receptors. Additional hedgerow planting and hedgerow tree planting along the northern and eastern external boundaries, and some of the internal boundaries within the Site, would help strengthened the landscape framework.

11.2.16 Following decommissioning the Site will be returned to its original condition. However, the landscape enhancement measures would remain, providing long-term benefits to the local landscape character of the area.

Cumulative and In-combination Effects

11.2.17 The relationship between the Application Site and cumulative developments have been considered. The construction and decommissioning phase of the Proposed Development is likely to occur in isolation, and not cumulatively with any other currently known developments in the area. For that reason, there would be no significant effects.

11.2.18 In terms of visual amenity once the site is operational, none of the viewpoints or visual receptors have been assessed as subject to significant cumulative effects.

Conclusion

11.2.19 The assessment has concluded that there would be some localised significant visual effects due to proximity and direct nature of views, gained from PRoWs within the Site.

11.2.20 Overall, the Proposed Development has been considered as responding well to the characteristic of the receiving environment, mitigating visual effects, whilst not compromising the requirements and technical aspects of this solar energy scheme.

11.3 BIODIVERSITY

Introduction

11.3.1An assessment of the likely significant effects of the Proposed Development on biodiversity has been undertaken. The assessment compiles information from a Desk Study, Extended Phase 1 Habitat Survey, Wintering and Breeding Bird Surveys, Otter and Water Vole Surveys and Great Crested Newt survey; enabling the determination of the likely ecological effects of the Proposed Development. A Confidential Badger Report is also appended to the assessment.

11.3.2The assessment establishes the likely presence of protected or notable species, identifies statutory designated sites for nature conservation in the vicinity of the Proposed Development, and evaluates the overall conservation status of the Application Site. The potential effects on identified ecological features including designated sites and protected and notable species is assessed in line with current guidance, and appropriate mitigation and enhancement measures are described.

Baseline conditions

11.3.3The Site is comprised of a number of fields, bounded by hedgerows (with scattered trees), post and wire fences and/or ditches. The fields themselves consist of intensively managed arable and sheep grazed pastoral farmland. Two large areas of semi-natural and plantation broadleaved woodland are present in

the western section of the Site and two smaller areas of woodland are also located within the Site boundaries. A number of scattered isolated mature trees are scattered throughout the fields; some being notably mature specimens.

11.3.4The Site is not located within any statutory designated site for nature conservation. A number of nationally and internationally designated sites are located within 5km – 10km of the site, details of these sites are provided within Chapter 6 (Biodiversity).

11.3.5There are records for a twelve non-statutory designated sites (all Wildlife Sites or LWS) within 2km of the Site boundaries, of which the closest, Coed Cord LWS, is within 200m of the Application Site.

Likely Significant Effects

11.3.6The assessment concluded that there was the potential for significant adverse effects on great crested newts, during the construction phase only. Specific mitigation measures have been identified as a result.

11.3.7No other significant adverse effects were identified on statutory or non-statutory designed sites or habitats, or on protected or notable species, including bats, birds, or other species in relation to the Proposed Development, or in-combination with other proposed developments in the wider landscape.

11.3.8Other short term, temporary, and/or not significant effects identified through the assessment have also been addressed as part of the iterative design process or standard good practice construction and site management measures.

Mitigation and Enhancement

11.3.9 Mitigation and enhancement measures will include the following:

- Pre-construction surveys for protected species and to inform additional avoidance or mitigation requirements during the construction phase;
- Biodiversity protection measures (construction phase) to be included in the CEMP;
- Appointment of Project Ecologist/ECoW;
- Great crested newt Mitigation Strategy, including confirmation of European Protected Species Mitigation licence (post-consent) granted by NRW before works commence;
- Hedgerows and trees will be retained and protected during construction and operation in-line with BS 5837:2012 Trees in relation to design, demolition and construction;
- The operational facility will not be lit (apart from emergency lighting associated with the battery storage facility) to avoid illuminating flightlines and foraging areas used by bats, in particular watercourse and ditch corridors, woodland edges and the hedgerow network. The lighting design (operational phase) will be in line with Bat Conservation Trust/Institute of Lighting Professionals guidance .

- Maintaining suitable exclusion buffers around streams/ditches, woodland, hedgerows, trees and ponds – all habitats likely to be most valuable to protected and notable species;
- Retaining and protecting on-site ponds to maintain aquatic habitat for amphibians, specifically great crested newts;
- Avoiding higher value habitats and retention of such habitats where they occur on-site, such as woodland, hedgerows, ponds and trees; and
- Habitat enhancements to include:
    - Creation of swale habitat;
    - Native species rich hedgerow planting and infilling to strengthen existing and gappy hedgerows;
    - Grassland seeding underneath the solar panels to create species diverse grassland; and
    - Creation of species diverse field margins around the development site and blocks of Wildflower meadow areas.

Cumulative and In-combination Effects

11.3.10 No cumulative or in-combination effects are anticipated in relation to the Proposed Development and other developments are anticipated.

Conclusion

11.3.11 With embedded design measures and mitigation in place as described, the Proposed Development will not result in any significant adverse effects on any habitats or species, or on statutory and non-statutory designated sites.

11.3.12 Minor (but not significant) positive effects are anticipated in relation to foraging, commuting, roosting and breeding bats and birds as well as for badgers, hazel dormice and reptiles, if present, as a result of habitat creation and diversification.

11.4 TRAFFIC AND TRANSPORT

Introduction

11.4.1An assessment of the traffic and transport related effects relating to the Proposed Development has been undertaken.

Baseline

11.4.2The development site is located to the west of the A525, which routes north to south along the eastern boundary of the site where it abuts the carriageway in places. The site is located approximately 1.5 kilometres to the northwest of St Asaph and 2.5 kilometres southwest of Rhuddlan.

11.4.3There are three Denbighshire County Council (DCC) Public Rights of Way (PRoW) which route across the site (201/8, 208/20 and 208/18).

11.4.4Construction access will be provided via two separate access junctions served by the A525 on the south-eastern and north-eastern site boundary. The south eastern site access is an existing priority T-junction serving Gwernigron Farmhouse. The northern eastern site access is an existing gated field access which serves open land. Both accesses are shown to be suitable for construction traffic.

11.4.5Once operational, the north-eastern access will revert to its current arrangement and the south-eastern access will be retained for operational requirements.

Assessment of Likely Significant Effects

11.4.6In total the construction of the solar farm will result in approximately 2,055 deliveries (4,110 movements) to the site, spread over the 27 week construction period. The deliveries will be spaced across the construction period, with an average of 13 deliveries (26 two-way vehicular movements) taking place each day over the 27 week construction period.

11.4.7There are three Denbighshire County Council (DCC) Public Rights of Way (PRoW) which route across the site (201/8, 208/20 and 208/18). As part of the development proposals it is proposed to permanently divert two of the PRoWs which currently pass through the site. Diversion orders are being sort alongside the planning application for the proposed solar farm site.

11.4.8It is not anticipated that the trips generated by the construction of the development proposals will have a significant impact on the local and strategic road networks.

11.4.9Solar Farms when operational do not give rise to significant traffic movements. During operation, solar farms have limited associated traffic generation, with visits for maintenance purposes using light vans approximately 10-20 times per year.

Mitigation and Enhancement

11.4.10 The Construction Traffic Management Plan sets out mitigation measures including management of deliveries, delivery time restrictions, construction warning signs and management of Public Rights of Way to minimise construction based traffic impacts.

11.4.11 Mitigation measures will be agreed between the appointed contractor and Denbighshire County Council as the Local Highway Authority.

Cumulative and In-combination Effects

11.4.12No significant cumulative or in-combination effects have been identified.

Conclusion

11.4.13 It is not anticipated that the trips generated by the construction of the development proposals will have a significant impact on the local and strategic road networks.

11.4.14 It is concluded that suitable routing and measures can be provided in conjunction with traffic associated with construction activities at the scheme.

11.5 HUMAN HEALTH

Introduction

11.5.1An assessment of the likely effects of the Proposed Development on human health has been undertaken.

Baseline Conditions

11.5.2The direct and indirect effects of the proposed development on human health have been considered and the following issues have been assessed:

- Noise;
- Air Quality (Construction Phase); and
- Electrical Risks (Transmission and Storage of electricity).

Likely Significant Effects

11.5.3It is considered that there will be no significant noise related issues associated with the proposed development due to the proposed mitigation measures. Therefore, there would not be any risk to human health as a result of noise.

11.5.4The key considerations in terms of air quality are the emissions associated with the construction phase of the development. The construction works have the potential to generate additional vehicles on the local road network, the main air pollutants of concern related to road traffic emissions are nitrogen oxides, ammonia, nutrient nitrogen deposition and acid nitrogen deposition.

11.5.5There will be no significant air quality related issues associated with the proposed development. Therefore, there would not be any risk to the population and human health as a result of air quality.

11.5.6Based on the design of the scheme and safety checks which are proposed, it is not considered that there would be any risk to human health as a result of the generation or storage of electricity on the proposed site.

Mitigation and Enhancement

11.5.7A series of mitigation measures are set out in the CTMP, which includes measures to reduce potential noise and air quality emissions associated with the construction period.

11.5.8A Fire and Safety Management Plan has been prepared to outline the measures which will be put in place to address any safety concerns around the energy storage component of the project.

11.5.9Maintenance visits to the site will be made throughout the year (c.10-20 visits per year). The maintenance visits will involve inspections of the equipment on site to ensure all equipment is kept in a good state to minimise any potential risk to human health.

Conclusion

11.5.10 The design of the scheme as well as the mitigation measures set out in the CTMP and the Fire and Safety Management Plan will ensure there are no significant risks to human health as a result of the proposed development.

11.6 AIR QUALITY

Introduction

11.6.1An Assessment of the Air Quality Impacts as a result of the construction phase has been carried out in accordance with best practice guidance.

Baseline Conditions

11.6.2 The operation of the solar farm will not result in any direct emissions to air, the construction works have the potential to generate additional vehicles on the local road network, which may impact on any ecological habitats adjacent to the roads used by construction vehicles.

11.6.3 The main air pollutants of concern related to road traffic emissions are nitrogen oxides (NOx), ammonia (NH3), nutrient nitrogen deposition and acid nitrogen deposition.

Likely Significant Effects

11.6.4 The nearest internationally-designated site is Liverpool Bay Special Protection Area (SPA) which is located 6.6km northwest of the application site. The nearest locally-designated site, an unnamed Ancient Woodland (AW) is located 300m east of the application site. Rhuddlan Pond Local Nature Reserve (LNR) and an unnamed Ancient Woodland are within 200m of the main roads used by construction vehicles.

11.6.5 The construction period will last up to 27 weeks. On this basis, any effect from construction traffic on designated ecological sites will be transient, any changes to ambient air quality conditions will re-equilibrate within a short period of time following completion of the construction phase, and there will be no long-term deterioration in conditions.

11.6.6 The construction works will generate 2,055 one-way Heavy Duty Vehicle (HDV) trips and 4,698 one-way Light Duty Vehicle (LDV) trips.

11.6.7 The construction phase will, therefore, generate Annual Average Daily Traffic (AADT) flows of 11 HDVs and 26 LDVs on the main identified construction route. Beyond this route, vehicles will distribute across the local highways network, such that flows on other roads will be lower.

11.6.8 The Air Quality Technical Note has identified that the Rhuddlan Pond Local Nature Reserve (LNR) and an unnamed Ancient Woodland lie within 200 m of roads included in the CTMP. The construction phase will generate AADT flows of 11 HDVs and 26 LDVs; these are well below the screening criteria of 200 HDVs and 1,000 LDVs presented in the Design Manual for Roads and Bridges

(DMRB) guidance. Further, as the construction phase will only last for 27 weeks, any air quality effects on designated sites will be temporary in nature.

11.6.9 Beyond the adjacent roads, traffic will distribute across the local highways network, such that site-related flows on other roads will be even lower.

11.6.10 Natural Resources Wales has previously indicated that it accepts the use of these criteria for the protection of designated ecological habitats in Wales. On this basis, the impact of the construction of the Proposed Development can be considered to be neutral in terms of local air quality.

Mitigation and Enhancement

11.6.11 No mitigation or enhancement measures are proposed in terms of air quality.

Cumulative and In-combination Effects

11.6.12No significant cumulative or in-combination effects have been identified.

Conclusion

11.6.13 The construction phase will generate additional vehicles on the local road network; however, these have been shown to be well below the DMRB screening criteria and for a temporary period of up to 27 weeks only.

11.6.14 Based on DMRB guidance, the impact of the construction of the proposed solar farm in St Asaph on designated sites is considered to be neutral, and no further assessment is required.

11.7 RISK OF MAJOR ACCIDENTS

Introduction

11.7.1An assessment of the potential risk of major accidents as a result of the proposed development has been undertaken. The assessment focusses on the potential fire risk associated with the battery storage element of the proposed site.

Baseline Conditions

11.7.2The Proposed Development would have the ability to generate and store electricity, as a battery energy storage facility is proposed towards the southern boundary of the site.

11.7.3An Energy Storage Safety Management Plan has been prepared to address any safety concerns relating to the Energy Storage System component of the project.

11.7.4Potential hazards, with a focus on fire risks have been identified, analysed, and addressed to minimise the likelihood and the severity of all foreseeable safety issues that may arise on site during the operational phase.

Likely Significant Effects

11.7.5 The Energy Storage System will consist of Lithium Iron Phosphate (LFP) storage modules, a popular Lithium Ion technology that is well known for being inherently safe, due to its low energy density that minimises risk of thermal runaway.

Mitigation and Enhancement

11.7.6The following mitigation measures have been proposed in the Energy Storage Safety Management Plan to address the identified risks:

- The temperature and humidity within the battery containers will be regulated by suitably sized heating and cooling equipment.
- The heating and cooling system status will be monitored by the Energy Management System (EMS). In the event of a heating/cooling failure being detected, the enclosure will be automatically switched into standby mode, preventing the battery modules from charging or discharging, and sending a notification to the operations and maintenance (O&M) team.
- The heating/cooling system will be subject to quarterly routine maintenance inspections to ensure the risk of failure is minimised.
- The battery containers will be suitably insulated and specified for the relative ambient conditions (IP 55), to prevent external agents to enter the enclosures.
- Periodic maintenance plan will include the cleaning of the container, changing of filters i.e. heating/cooling system, and a detailed inspection of the equipment to ensure all equipment and connections are in good state.
- The Energy Management System (EMS) will continuously monitor the state of every module rack (voltage, state of charge etc) and thanks to in-built safety limits, it will not allow the battery, or any individual component, to reach a dangerous state that could lead to safety issues.
- If a fault arises, an alarm is triggered, and the O&M team is made aware of the issue. The O&M team will be able to act remotely, initiate a remote shutdown if required, or send a technician to site to investigate the issue and perhaps replace damaged/faulty components.
- If rack voltage or state of charge drops below or rises above safe levels, the battery DC contactors are automatically opened, isolating each rack individually preventing current continuing to flow between racks, essentially isolating and significantly reducing the risk of thermal runaway.
- Thermal runaway will be mitigated by procuring an Lithium Iron Phosphate (LFP) Energy Storage System (ESS). In the event of runaway occurring it has proven that whilst it is possible for the battery to catch fire it does not pose any risk of explosion.
- Every battery enclosure is equipped with two different types of fire detection systems, smoke and heat detectors. Multiple sensors of each type are installed to increase redundancy in the event one or

more are faulty. This enables early fire detection and the activation of a fire suppression system if installed.

- If the fire detection system is triggered, an alarm is sent to the local fire brigade that will promptly intervene to further contain the fire if necessary.
- The fire detection system will be subject to quarterly routine maintenance and testing.
- The enclosures will be made of non-combustible equipment to minimise the spread of the fire outside the enclosure.
- The site will also be at a minimum distance of 20m from buildings and areas with public access. This will minimise the likelihood of fire spreading from one container to others and potentially becoming a hazard for the public.
- All containers and other equipment will be placed on concrete slabs and raised off the ground to provide protection from flooding.

Conclusion

11.7.7The precautions set out to manage all foreseeable risks associated with the storage of energy on the site will minimise any potential impacts.

11.7.8The Safety Management Plan will be reviewed and updated in consultation with the North Wales Fire and Rescue Service. The Management Plan will also include Energy Storage System supplier recommendations, in accordance with current and future UK regulations, guidelines and industry recommendations to ensure risks of major accidents are mitigated.

11.8 SUMMARY

11.8.1The design of the Proposed Development has taken account of the likely significant environmental effects and where necessary mitigation measures form an integral part of the Proposed Development to ensure that the environment is suitably protected.

11.8.2The ES demonstrates that there are no overriding environmental constraints which would preclude the Proposed Development on the Application Site.