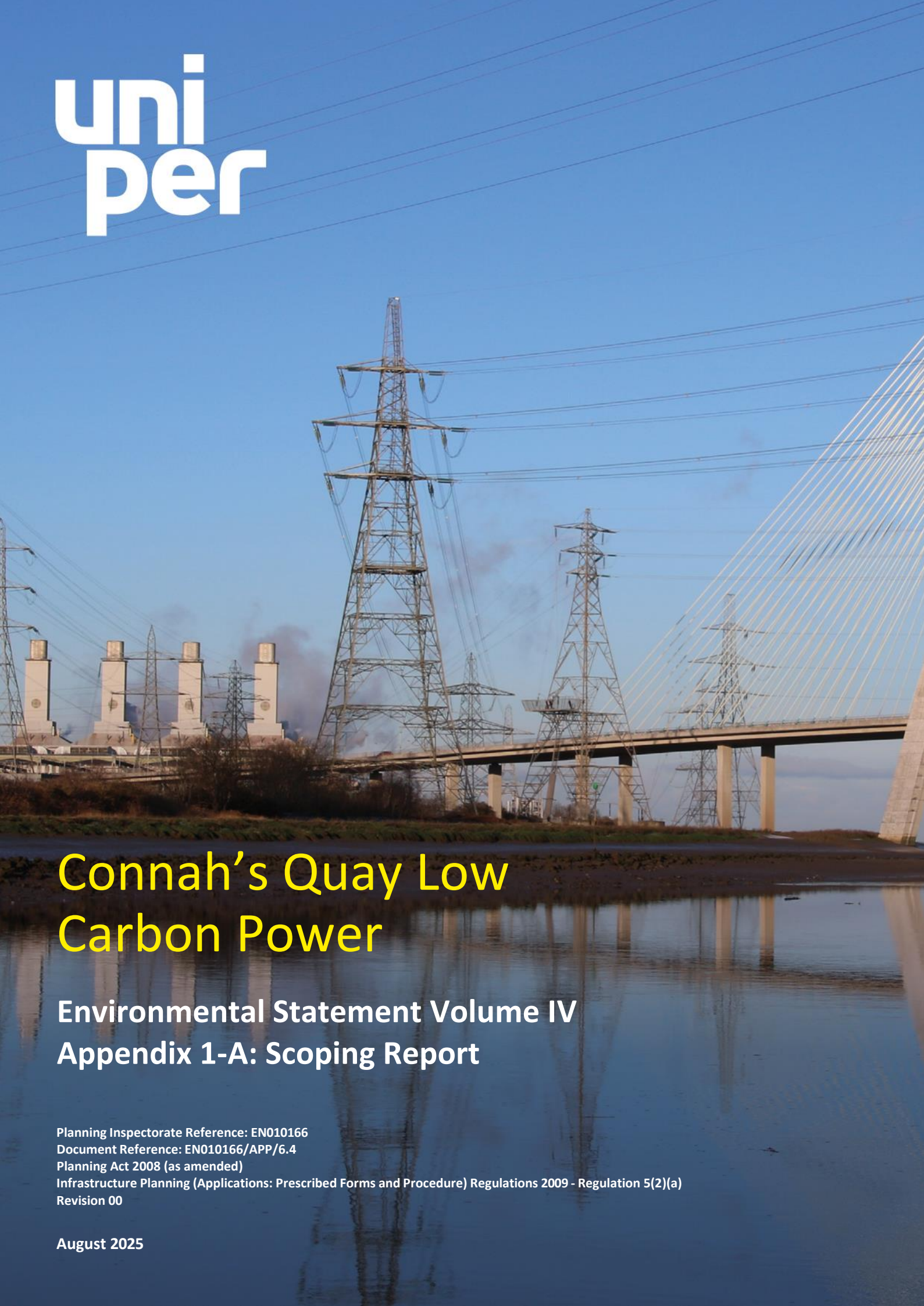

Connah's Quay Low Carbon Power

Environmental Statement Volume IV
Appendix 1-A: Scoping Report

Planning Inspectorate Reference: EN010166
Document Reference: EN010166/APP/6.4
Planning Act 2008 (as amended)
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(a)
Revision 00

August 2025

PINS Ref: EN010166

Connah's Quay Low Carbon Power

Scoping Report

Document Reference 60717119

Uniper

Delivering a better world

Prepared for:

Uniper

Prepared by:

AECOM Limited

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1. Introduction

1.1 Background

1.1.1 Uniper UK Limited (hereafter referred to as 'the Applicant') has commissioned this Environmental Impact Assessment (EIA) Scoping Report to support an application for a scoping opinion under Regulation 10 ('Application for scoping opinion') of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[1] (hereafter referred to as the 'EIA Regulations'), to inform the scope and content of an EIA for a Combined Cycle Gas Turbine (CCGT) Generating Plant fitted with Carbon Capture Plant (CCP) on land at, and in the vicinity of, the existing Connah's Quay Power Station (Kelsterton Road, Connah's Quay, Flintshire, CH6 5SJ), North Wales.

1.1.2 The proposed CCGT generating station will require natural gas, carbon dioxide (CO_2), electricity and water connections, and will be designed to operate with post-combustion carbon capture and compression plant installed such that the plant can be operated as a dispatchable, low-carbon generating station ('Connah's Quay Low Carbon Power', referred to herein as 'the Proposed Development'). The indicative land under consideration for the Proposed Development (hereafter referred to as the 'Site') is shown on **Figure 1-1** and **Figure 1-2 (Appendix A)**. The indicative locations of each element of the Proposed Development are provided in **Figure 1-3 (Appendix A).** Further detail on the elements of the Proposed Development is provided in **Chapter 3: The Proposed Development**.

1.1.3 The Proposed Development is subject to ongoing technical studies, to provide flexibility and to align with the current grid connection, but is expected to comprise the development of up to two CCGT units achieving a net electrical output capacity of up to 1,380 megawatts (MW) (with CCP operational) onto the national electricity transmission network.

1.1.4 The Proposed Development expects to make use of transport and storage networks owned and operated by Liverpool Bay CCS Limited, currently under development as part of the HyNet Carbon Dioxide Pipeline project[2] (referred to as the 'HyNet CO_2 Pipeline Project'), which will transport CO_2 captured from existing industries in North Wales and North-West England, as well as from new hydrogen production facilities that are proposed as part of HyNet North West Project. The captured CO_2 will be stored in depleted offshore gas reservoirs.

1.1.5 This EIA Scoping Report considers the environmental context of the Site and surrounding areas and provides an explanation of the likely significant effects of the Proposed Development on the environment. Where impacts are considered to have the potential to cause likely significant environmental effects, these are identified and the proposed approach to be used to characterise the impacts and understand the likely significance of their effects is outlined. This report also provides the justification and rationale for

[1] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/572). London: HMSO.
[2] PINS, 2023; *HyNet Carbon Dioxide Pipeline* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/projects/Wales/HyNet-Carbon-Dioxide-Pipeline/ (Accessed 13/12/2023)

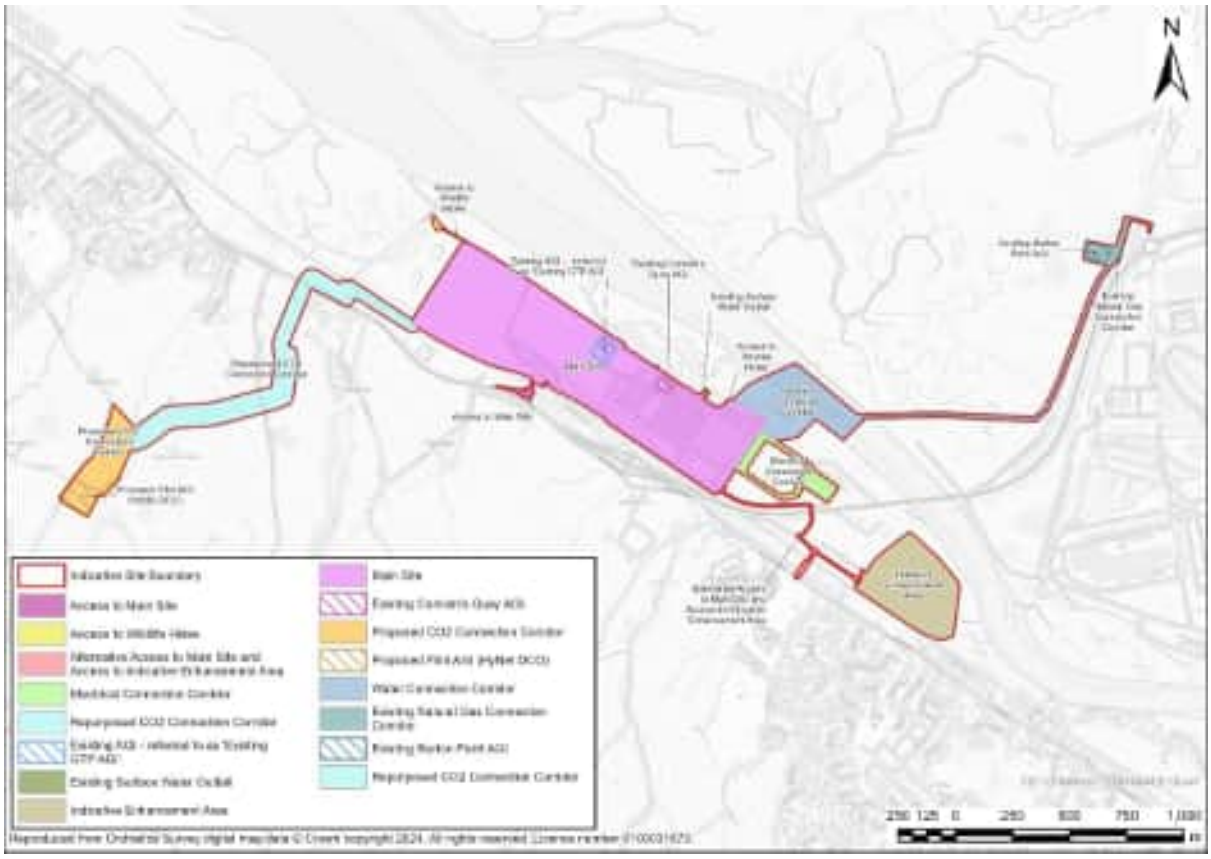
scoping out environmental topics or receptors from the EIA where no likely significant effects are expected as a result of the Proposed Development.

1.1.6 The EIA is an iterative process that feeds into the engineering design process to mitigate likely significant environmental effects where they are predicted to occur. The final outline design iteration, along with the findings of the EIA, will be reported in an Environmental Statement (ES) in accordance with EIA Regulations and will be submitted with the Development Consent Order (DCO) Application in accordance with Regulation 5 (2)(a) of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009[3] (as amended) (hereafter referred to as the 'APFP Regulations').

1.2 Definitions

1.2.1 For the purposes of this report the following definitions have been used (refer to **Figure 1-3 (Appendix A)**; reproduced in **Plate 1-1**):

Plate 1-1 Indicative DCO Site Layout



- 'the Main Site' is a term to reflect the CCGT and CCP site including the proposed laydown area, internal access roads, existing utilities connections for welfare use, and the existing Connah's Quay Power Station;
  - the 'Access to the Main Site' comprises the existing Kelsterton Road and adjoining hardstanding immediately south of the Main Site, in addition to a layby off the A548 and the relict structures of a former slip-road directly between the A548 and Kelsterton Road;

[3] The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (SI 2009/2264). London: HMSO.

  - the ‘Existing Surface Water Outfall’ is the area surrounding the existing artificial outfall for surface water drainage from the Main Site towards the Dee Estuary;
  - the ‘Access to Wildlife Hides’ are the areas surrounding the existing wildlife hides and associated access roads outside of the Main Site used by the Deeside Naturalist Society;

- Pipelines for the transport of gas require Above Ground Installations (AGIs) typically installed at intervals along the pipeline, or at connection points between pipelines, or between pipelines and end user installations. These provide points for access, connection and monitoring to support maintenance and the safe operation of the pipelines. The AGIs referred to in the Scoping Report are:
  - The ‘Flint AGI’, which is part of the Hynet CO_2 Pipeline Project, which provides connection to external geological storage;
  - The ‘Existing GTP AGI’ associated with the Gas Treatment Plant (GTP), via which natural gas was received from Liverpool Bay through a dedicated pipeline until June 2023, located in the north-central part of the Main Site. At this stage, it is assumed that the Existing GTP AGI could be repurposed to allow for the export of CO_2 from the Main Site;
  - The ‘Proposed CO_2 AGI’ is a potential new AGI, which may be required at a location within the Main Site for export of CO_2 if the Existing GTP AGI is not repurposed;
  - ‘Connah’s Quay AGI’ is the AGI through which the existing gas-fired station receives natural gas from the National Transmission System (NTS) located in the east of the Main Site;
  - Burton Point AGI is part of the NTS from which a dedicated spur links to the existing Connah’s Quay AGI providing natural gas to the existing gas-fired station;
- ‘Proposed CO_2 Connection Corridor’ is the area surrounding the proposed CO_2 export pipeline to be constructed, that interfaces with the Repurposed CO_2 Connection Corridor at one end and the Flint AGI at the other. The Proposed CO_2 Connection Corridor includes the Flint AGI itself and its curtilage. Any modification works required to connect the Proposed CO_2 Connection to the Flint AGI, will form part of the Applicant’s DCO application;
  - ‘Proposed CO_2 Connection’ refers to the pipeline within the Proposed CO_2 Connection Corridor;
- ‘Repurposed CO_2 Connection Corridor’ is the area surrounding the re-purposed existing gas pipeline that interfaces with the Existing GTP AGI or Proposed CO_2 AGI (Main Site) at one end and the Proposed CO_2 Connection Corridor at the other;
  - ‘Repurposed CO_2 Connection’ refers to the pipeline that interfaces with the Existing GTP AGI or Proposed CO_2 AGI at one end and the Proposed CO_2 Connection at the other;
  - The Repurposed CO_2 Connection is partially within the Main Site and partially within the Proposed CO_2 Connection Corridor; the

Repurposed CO_2 Connection Corridor applies where the Repurposed CO_2 Connection is outside of the Main Site;

- 'Water Connection Corridor' is the area surrounding the existing (and location of potential replacement) abstraction and discharge infrastructure for the abstraction and discharge of cooling water sourced from the River Dee;
  - 'Water Connection' refers to the abstraction and discharge infrastructure;
- 'Existing Natural Gas Connection Corridor' is the area surrounding the existing gas import pipeline that interfaces with the Connah's Quay AGI (Main Site) and the existing Burton Point AGI, in addition to the Burton Point AGI itself and its curtilage;
  - 'Existing Natural Gas Connection' refers to the pipeline itself;
  - The Existing Natural Gas Connection is partially within the Main Site and Water Connection Corridor; the Existing Natural Gas Connection Corridor applies where the Existing Natural Gas Connection is outside of these Site aspects;
- 'Electrical Connection Corridor' is the area surrounding the existing electrical export transmission cable(s) that interface with the Main Site and the existing National Grid 400 kV Deeside Substation, in addition to the National Grid 400 kV Deeside Substation itself;
  - 'Electrical Connection' refers to the transmission cables;
- 'Indicative Enhancement Area' is an area of vacant land under Applicant ownership south-east of the Main Site which may be used for biodiversity mitigation and/ or enhancement;
- the 'Alternative Access to Main Site and Access to Indicative Enhancement Area' comprises existing private access roads between the Main Site, the Indicative Enhancement Area, and the B5129; and
- 'the Site' is a term to reflect the whole of the Proposed Development including the Main Site as well as the natural gas pipeline, CO_2 pipeline, electrical transmission cable connection and other ancillary infrastructure (including cooling water infrastructure).

1.2.2 Further details of the above defined locations are included in **Chapter 2: Description of the Existing Environment**.

1.3 Strategic Context

1.3.1 The power industry will play a critical role in delivering the UK's Net Zero target of 2050 both through the decarbonisation of its own activities and through the provision of low-carbon power to support decarbonisation via the electrification of other sectors such as transport and heating. The need to move to low-carbon generation is therefore a key challenge for the UK's power industry and in 2021 the UK Government pledged a commitment to decarbonise the UK's electricity system by 2035.

1.3.2 The Committee on Climate Change (CCC) has stated the need to invest in and deploy carbon capture and negative emissions technology at scale in order to reach UK's target of net zero by 2050[4].

1.3.3 The development of clean gas generation projects would form an important part of a robust and comprehensive energy network that ensures the UK has stable and secure generation whenever it is needed.

1.3.4 To meet the UK's sixth Carbon Budget, the Government outlined its ambition to capture 20 $MtCO_2$ to 30 $MtCO_2$ per year by 2030 through deployment of four Carbon Capture Use and Storage (CCUS) clusters. The first two CCUS clusters have been selected and are under negotiation as 'Track 1' clusters, sequenced for deployment in the UK by the mid-2020s. The Hynet cluster has Track 1 status and includes the Hynet CO_2 Pipeline Project that the Proposed Development intends to discharge captured CO_2 into.

1.3.5 Connah's Quay Power Station site is therefore a strategic location for decarbonisation; due to its proximity to suitable CO_2 transport and storage infrastructure via the HyNet cluster. It offers the benefits of re-use of existing infrastructure connections, including water, natural gas and electricity.

1.4 The Applicant

1.4.1 The Applicant is a UK-based company, wholly owned by Uniper SE (Uniper) through Uniper Holding GmbH. Uniper is an international energy company that operates roughly 22.5 GW of generation capacity in Europe. Uniper has activities in more than 40 countries and roughly 7,000 employees worldwide. In the UK, Uniper owns and operates a flexible generation portfolio of seven power stations, a fast-cycle gas storage facility and two high pressure gas pipelines, from Theddlethorpe to Killingholme and from Blyborough to Cottam.

1.4.2 Uniper is committed to investing more than €8 billion (~£6.9 billion) in growth and transformation projects between 2023 and 2030. This includes developing new renewables projects, investing in clean gases such as hydrogen, and new low or zero carbon power plants and by progressively transforming Uniper's existing fleet into Europe's leading source of zero-carbon power. Uniper intends to be completely carbon-neutral by 2040 and aims for its installed power generating capacity to be more than 80% zero-carbon by 2030.

1.5 Consenting Regime

1.5.1 UK legislation is influenced by a variety of international agreements (including European Union (EU) directives, regulations, and agreements), which are outlined in this Scoping Report. Following the UK leaving the EU under the terms of the European Union (Withdrawal Agreement) Act 2020[5] (the 'Withdrawal Act'), broadly, EU-derived domestic legislation and certain EU legislation continue to have effect in domestic law.

1.5.2 In exercise of the powers in the Withdrawal Act, the Government made The Environmental Assessments and Miscellaneous Planning (Amendment) (EU

[4] The Committee on Climate Change, 2019, *Net Zero Technical Report* [online]. Available at: https://www.theccc.org.uk/publication/net-zero-technical-report/ (Accessed 20/12/2023).
[5] European Union (Withdrawal Agreement) Act 2020 (c. 1). London: HMSO.

Exit) Regulations 2018[6]. These regulations provide for the EIA Regulations to be amended to ensure they function correctly after the UK's exit from the EU. In particular, the amendments update references within the EIA Regulations to EU law, Member States and related terms to reflect the UK leaving the EU. The regulations do not make substantive changes to the way the EIA regime operates following the UK leaving the EU.

1.5.3 The consenting regime for the Proposed Development is provided by the Planning Act 2008[7] ('the 2008 Act'), the APFP Regulations and the EIA Regulations.

1.5.4 Part 3, Section 14 of the 2008 Act defines the types of development that constitute a 'nationally significant infrastructure project' (NSIP) and require development consent under Section 31. In the 'field' of energy these include generating stations, electric lines, underground gas storage facilities, liquified natural gas (LNG) facilities, gas reception facilities, gas transporter pipelines and other forms of pipeline.

1.5.5 The Proposed Development falls within the definition of NSIP under Sections 14(1)(a) and 15(1) and (3A) of the 2008 Act as it is for the construction of an onshore generating station in Wales, that does not generate electricity from wind, and which has a capacity of more than 350 megawatts (MW).

1.5.6 Section 115(4A) of the 2008 Act also provides that an application for development consent for an onshore generating station in Wales, which has a capacity of more than 350 MW, can also include 'associated development'. Associated development should either support the construction or operation of the principal development (the NSIP) or help address its impacts. Examples of associated development for a generating station include gas and electricity grid connections.

1.5.7 The Proposed Development is also a 'Schedule 1' development under the EIA Regulations as it constitutes "*Thermal power stations and other combustion installations with a heat output of 300 megawatts or more*". As such, an EIA is required for the Proposed Development and an ES must be prepared in accordance with these Regulations to accompany the DCO application.

Requirement for a Development Consent Order

1.5.8 The Applicant is required to seek a DCO to construct and operate the Proposed Development, under Section 31 of the 2008 Act. Section 37 of the 2008 Act also governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the APFP Regulations which state that an application must be accompanied by an ES, where a development is considered to be 'EIA development' under the EIA Regulations.

1.5.9 A DCO application ('the Application') will be submitted to the Planning Inspectorate (PINS) who will examine the Application and make recommendations to the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ) pursuant to the 2008 Act, who will

[6] *The Environmental Assessment and Miscellaneous Planning (Amendment) (EU Exit) Regulations 2018* (SI 2018/1232). London: HMSO.
[7] *Planning Act 2008* c.29. London: HMSO.

subsequently determine whether or not a DCO should be granted for the Proposed Development.

1.6 Requirement for an Environmental Impact Assessment

1.6.1 Regulation 3(1) of the EIA Regulations defines the meaning of 'EIA development' (with reference to Schedules 1 and 2 to the EIA Regulations). Schedule 1 to the EIA Regulations, which describes developments for which an EIA is necessary, includes "*thermal power stations, and other combustion installations, with a heat output of 300 megawatts or more*." EIA is compulsory for Schedule 1 developments given the type and/or the scale of the development is likely to have the potential for significant effects on the environment.

1.6.2 Given its capacity and the nature of the proposed activities, the Proposed Development will therefore be an 'EIA development' and consequently a formal EIA screening opinion is not being sought from the SoS.

1.6.3 As the Applicant proposes to provide an ES with the application for a DCO, this report constitutes the Applicant's notification under Regulation 8 (1b) of the EIA Regulations.

1.6.4 Having determined that an ES will be included as part of the Application for development consent, which will present the information of the EIA, in accordance with Regulation 10(1) of the EIA Regulations, the Applicant is applying to the SoS for their opinion as to the scope and level of detail of the information to be provided in the ES.

1.6.5 **Figure 1-2 (Appendix A)** illustrates the indicative boundary for the Site (hereafter referred to as the 'Site Boundary'), which comprises the proposed CCGT generating station and CCP and associated infrastructure including existing gas infrastructure connections (including Repurposed and Proposed CO_2 and Existing Natural Gas Connection Corridors), Water Connection Corridor, Electrical Connection Corridor, areas for ancillary works to access roads, ancillary works to existing minor assets, as well as an indicative laydown area for construction and an Indicative Enhancement Area which may be used for biodiversity. The Site Boundary covers a large area to allow flexibility in the potential routing of gas and grid connections and will be refined as design progresses during the DCO application preparation process.

1.6.6 A description of the existing land-use within and in proximity to the Site is presented in **Chapter 2: Description of the Existing Environment**, and an overview of the Proposed Development is presented in **Chapter 3: The Proposed Development**.

1.7 Marine Licence

1.7.1 Given the potential abstraction and discharge locations area (Water Connection Corridor) within the marine environment, depending on the extent of any upgrades that may be required to existing infrastructure, the Application for a DCO for the Proposed Development may include provisions for a deemed Marine Licence (DML). Consultations regarding the DML and

any associated assessment requirements will be held with Natural Resources Wales (NRW) as the EIA/DCO application progresses.

1.8 Objectives of Scoping

1.8.1 The scoping phase of the EIA process provides a framework for identifying the potential environmental impacts arising from the Proposed Development, establishing the likely significant environmental effects and distinguishing the priority issues to be addressed within the ES. Scoping also allows stakeholders an early opportunity to comment on the proposed structure, methodology and content of the ES.

1.8.2 This Scoping Report has been prepared in accordance with the relevant legislative provisions and Advice Notes published by PINS.

1.8.3 **Table 1-1** presents a list of information that should be included in a request for a scoping opinion, as prescribed by Regulation 10(3) of the EIA Regulations.

Table 1-1 Information Required for a Request for a Scoping Opinion

Description of Information Required (Regulation 10(3))	Supplementary Descriptions (Regulation 8(3))	Chapter in Scoping Report where presented
A plan sufficient to identify the land	-	**Figures 1-1, 1-2 and 1-3 (Appendix A)**
A description of the proposed development, including its location and technical capacity	A description of the physical characteristics of the whole development; and a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.	**Chapter 3: The Proposed Development** **Chapter 2: Description of the Existing Environment** **Figure 1-3 (Appendix A)**
An explanation of the likely significant effects of the development on the environment	…resulting from: the expected residues and emissions and the production of waste, where relevant; and the use of natural resources, in particular soil, land, water and biodiversity.	**Chapter 6: Air Quality;** **Chapter 7: Noise and Vibration;** **Chapter 8: Traffic and Transport;** **Chapter 9: Terrestrial and Aquatic Ecology;** **Chapter 10: Marine Ecology;** **Chapter 11: Water Environment and Flood Risk;** **Chapter 12: Geology and Ground Conditions;** **Chapter 13: Landscape and Visual Amenity;** **Chapter 14: Physical Processes;** **Chapter 15: Cultural Heritage;** **Chapter 16: Socio-Economics, Recreation and Tourism;** **Chapter 17: Climate Change;** **Chapter 18: Human Health;** **Chapter 19: Major Accidents and Disasters;** **Chapter 20: Materials and Waste;**

Description of Information Required (Regulation 10(3))	Supplementary Descriptions (Regulation 8(3))	Chapter in Scoping Report where presented
		Chapter 21: Cumulative and Combined Effects; and **Chapter 22: Aspects to be Scoped Out.**
Such other information or representations as the person making the request may wish to provide or make		**Chapter 1: Introduction;** **Chapter 4: Project Alternatives and EIA Methodology; and** **Chapter 5: Planning and Policy Need.**

1.8.4 **Table 1-2** presents the information highlighted in paragraph 4.2 (and associated Insert 2) of Advice Note 7 'Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements'[8] regarding the content of a Scoping Report, including signposting to the location in this report where the information is presented.

Table 1-2 Information provided in the Scoping Report (based on Advice Note 7)

Description of Information Required	Chapter in Scoping Report where the Information is Presented
The Proposed Development	
• an explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters;	**Chapter 3: The Proposed Development**
• referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development.	**Figures 1-1, 1-2 and 1-3 (Appendix A)**
EIA Approach and Topic Areas	
• an outline of the reasonable alternatives considered and the reasons for selecting preferred option;	**Chapter 4: Project Alternatives and EIA Methodology**
• a summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues;	**Chapter 23: Summary of Potentially Likely Significant Environmental Effects**
• a detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided;	**Chapter 22: Aspects to be Scoped Out.** **Chapter 23: Summary of Potentially Likely Significant Environmental Effects**

[8] PINS (2020). Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements, Republished June 2020 [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements / (Accessed 01/12/2023).

Description of Information Required	Chapter in Scoping Report where the Information is Presented
• results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters;	**Chapter 2: Description of the Existing Environment** **Chapters 6-22: Environmental Topics**
• aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude;	**Chapter 4: Project Alternatives and EIA Methodology** **Chapters 6-22: Environmental Topics**
• any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	**Chapters 6-22: Environmental Topics**
Information Sources • references to any guidance and best practice to be relied upon;	**Chapter 6-22: Environmental Topics**
• evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities);	**To be agreed as part of this Scoping Report.**
• an outline of the structure of the proposed ES.	**Chapter 4: Project Alternatives and EIA Methodology**

1.9 Structure of the Remainder of this Report

1.9.1 The remainder of this report is structured as follows:

- **Chapter 2 – Description of the Existing Environment**: provides a description of the Site and the surrounding area, together with a description of potentially sensitive environmental receptors within the vicinity of the Site;
- **Chapter 3 – The Proposed Development**: outlines the key elements of the Proposed Development, the infrastructure to be developed and the function of the operational plant;
- **Chapter 4 –Project Alternatives and EIA Methodology**: provides an overview of the approach that will be taken to presenting the alternatives that are considered during the Proposed Development design and outlines the structure for the proposed ES;
- **Chapter 5 – Planning Policy and Need**: identifies the key documents relating to national and local planning policy, together with a summary of the principal planning policies or provisions as relevant to the need for Proposed Development;
- **Chapters 6 to 21 – Scoping Assessment of Environmental Issues**: presents baseline information and provides a discussion of how the Proposed Development may interact with the different aspects of the receiving environment, together with a description of the proposed assessment methodologies, guidance and current best practice to be adopted for the EIA of the Proposed Development (or, as appropriate, its design);

- **Chapter 22 – Aspects to be Scoped Out**: provides a summary of the issues proposed to be scoped out of the EIA and reasoning why, including a summary in **Table 22-1**;
- **Chapter 23 – Summary of Potential Likely Significant Environmental Effects** summarises the findings of this EIA Scoping Report in relation to matters proposed to be scoped in and out of the EIA;
- **Chapter 24 – Glossary**;
- **Appendix A** – Figures, referenced within this report:
  - **Figure 1-1:** Site Location Plan;
  - **Figure 1-2:** Indicative DCO Site;
  - **Figure 1-3:** Indicative DCO Site Layout;
  - **Figure 7-1:** Demolition and Construction Noise Study Area, Operational Noise Study Area, Sensitive Receptors and Baseline Sound Monitoring Locations;
  - **Figure 8-1:** Local Highway Network;
  - **Figure 8-2:** Proposed Locations for Traffic Surveys;
  - **Figure 9-1:** Habitat Sites and National Designated Sites within 15 km;
  - **Figure 9-2:** National and Local Statutory Designated Sites within 2 km;
  - **Figure 9-3:** Ancient Woodlands and Priority Habitats within 2 km;
  - **Figure 9-4:** Indicative UK Habitats;
  - **Figure 11-1:** Surface Water Features;
  - **Figure 11-2:** WFD Waterbodies;
  - **Figure 11-3:** Development Advice Map Zones;
  - **Figure 11-4:** Flood Map for Planning (Rivers and Seas);
  - **Figure 11-5:** Surface Water Flood Risk;
  - **Figure 12-1:** Geology and Ground Condition Areas;
  - **Figure 12-2:** Predictive Agricultural Land Classification (ALC) Map;
  - **Figure 13-1:** National Landscape Designations;
  - **Figure 13-2:** National Landscape and Marine Character Areas;
  - **Figure 13-3:** Local Authority Boundaries;
  - **Figure 13-4:** National Forestry Inventory;
  - **Figure 13-5:** Public Rights of Way;
  - **Figure 13-6**: Indicative Viewpoint Locations;
  - **Figure 13-7:** Zone of Theoretical Visibility – 56 m Building Height;
  - **Figure 13-8:** Zone of Theoretical Visibility – 105 m Building Height;
  - **Figure 15-1:** Designated Heritage Assets; and
  - **Figure 15-2:** Location of Marine and Cultural Heritage Study Area.

- **Appendix B** – Preliminary Ecological Appraisal;
- **Appendix C** – Gazetteer;
- **Appendix D** – Long List of ‘Other Developments’; and
- **Appendix E** – Transboundary Effects Matrix.

2. Description of the Existing Environment

2.1 Proposed Development Site and Surrounding Area

2.1.1 The Proposed Development is located approximately 0.6 km north-west of Connah's Quay in Flintshire, north-east Wales. The Main Site, together with the connection corridors for the electrical grid connection, gas (natural gas and CO_2) connections, water abstraction and discharge, indicative enhancement area, and ancillary works to access roads and minor assets, will be located within the administrative boundary of Flintshire County Council (FCC).

2.1.2 The Site encompasses a total area of approximately 112 hectares (ha) and is indicative at this stage. The land required for the Proposed Development will be subject to appraisal and refinement as the preparation of the Application progresses. The final area and layout that will be incorporated within the proposed DCO Order limits will be determined through ongoing studies of potential opportunities and constraints and discussions with relevant stakeholders.

2.1.3 Distances to key receptors / sites provided in this report have been taken from the closest Site Boundary to the receptor / feature.

2.1.4 **Figure 1-3 (Appendix A)** shows the boundaries for the key elements of the Proposed Development. Further detail on the Proposed Development is provided in **Chapter 3: The Proposed Development**. These elements have been listed below in order to identify the existing environment for the full scope of works covered in this Scoping Report:

- Main Site;
- Repurposed CO_2 Connection Corridor;
- Proposed CO_2 Connection Corridor;
- Water Connection Corridor;
- Existing Natural Gas Connection Corridor;
- Electrical Connection Corridor; and
- Indicative Enhancement Area.

Main Site

2.1.5 The Main Site (see **Plate 2-1**), which includes the existing Connah's Quay Power Station owned and operated by the Applicant, is accessed from Kelsterton Road, via the A548.

Plate 2-1 Aerial photograph of the Main Site and existing features

2.1.6 The existing Connah's Quay Power Station is a four-unit combined CCGT plant providing 1,380 MW of dispatchable power exported to the National Grid.

2.1.7 The existing gas-fired CCGT generating station also includes supporting infrastructure, including settlement ponds, cooling towers, and water treatment plant, in addition to buildings for storage and workshops, administration and staff welfare, security facilities, internal access roads, and parking. Cooling water abstraction and discharge points for the existing Connah's Quay Power Station are located in the River Dee, within the proposed Water Connection Corridor, adjacent to the Main Site.

2.1.8 The current generation plant is authorised via a Section 36 consent and has an Environmental Permit managed by NRW.

2.1.9 The existing gas-fired station receives natural gas from the NTS via a dedicated spur from Burton Point AGI that passes under the River Dee (this is referred to as the Existing Natural Gas Connection) and links to the existing Connah's Quay AGI (hereafter referred to as 'Connah's Quay AGI') located in the east of the Main Site.

2.1.10 Until June 2023, natural gas was also received from Liverpool Bay via a dedicated pipeline to an existing GTP currently located on the Main Site via an existing AGI, located in the north-central part of the Main Site (referred to as the 'Existing GTP AGI').

2.1.11 The gas supply from Liverpool Bay has now ceased due to depletion of gas reserves in the off-shore fields and will not be available for the Proposed

Development. It is therefore proposed that the Existing GTP will be demolished.

2.1.12 An existing 400 kV high-voltage overhead electrical transmission line (the 'HV overhead line') runs parallel to the south-west border within the Main Site.

2.1.13 Kelsterton Brook passes beneath the Main Site, beneath the cooling towers of the existing Connah's Quay Power Station. The watercourse is culverted at this location and outfalls to the Dee Estuary north of the Main Site via an existing artificial outfall structure (hereafter referred to as the 'Existing Surface Water Outfall').

2.1.14 Fields currently leased out by the Applicant for grazing sheep and lined by hedgerows and farm tracks are located within the north-west of the Site. Elements of the Proposed Development including Access to Wildlife Hides and the Existing Surface Water Outfall extend into the Dee Estuary.

2.1.15 The Main Site is relatively flat with an average elevation of 7.3 m Above Ordnance Datum (AOD) and is approximately 56.5 ha.

2.1.16 The Main Site is bordered to the north, east and north-west by the Dee Estuary, to the east and south-east by the existing National Grid 400 kV Deeside Substation, and to the south and south-west by the North Wales Main Line railway.

2.1.17 The Dee Estuary is designated as a Ramsar site, Special Area of Conservation (SAC), Special Protection Area (SPA), and Site of Special Scientific Interest (SSSI) due to its size and topography, its assemblage of diverse marine, coastal, and intertidal habitats, and its importance for passage and wintering waterfowl and intertidal plant species. The majority of the land directly north of the Main Site is regularly underwater at high tides.

2.1.18 The nearest towns are Connah's Quay, located approximately 0.6 km to the south-east, and Flint, located approximately 0.8 km to the north-west (to their respective nearest extents). The nearest residential receptors to the Main Site are located along Kelsterton Road, with the closest receptor being approximately 35 m from the Main Site. Land to the south and south-west is predominantly rural in nature, with interspersed residential properties and agricultural land.

2.1.19 The Main Site is currently proposed to be accessed via the existing Kelsterton Road. Additional works at the existing access to the Main Site may be required south of the Main Site, located primarily south of the North Wales Main Line railway, west of the residential properties on Kelsterton Road, and immediately north and east of the A548. This access to Main Site comprises the existing Kelsterton Road, including a bridge over the North Wales Main Line railway, and the location of a relict slip-road between the A548 and Kelsterton Road. It is comprised of hardstanding with small areas of roadside (within kerbs), trees and roadside grass, and is approximately 0.4 ha.

2.1.20 Further existing internal access roads will be used as alternative access to the Main Site, refer to **Figure 1-3 (Appendix A)**. This alternative access runs from (grid reference) SJ283705 approximately north to SJ283707 (north of the A548 Flintshire Bridge), before diverting west to the Main Site at

SJ279708 (north of the North Wales Main Line railway). These roads comprise existing hardstanding only.

2.1.21 Additional maintenance or minor upgrade works adjacent to the Main Site may be required at the existing Access to Wildlife Hides immediately north-east (SJ279712) and immediately north-west (SJ267719) of the Main Site and at the Existing Surface Water Outfall immediately north (SJ278712) of the Main Site. These are comprised of hardstanding, artificial structures, and minor adjacent areas of vegetation (surface water outfall only) within the Dee Estuary Ramsar site, SAC, SPA, and SSSI, and are collectively approximately 0.3 ha in total.

Repurposed CO_2 Connection Corridor

2.1.22 The Repurposed CO_2 Connection Corridor is located west of Little Leadbrook Farm (at approximately grid reference SJ253710) and south of the River Dee (approximately SJ268719). Between these points, its route runs generally east, north of Leadbrook Farm (to SJ260712), before diverting generally north to north-west of Essity Oakenhold Mill (SJ261717), before diverting generally south-east to north of Bryn Thomas Cranes (SJ265715), before finally diverting north-east to its endpoint.

2.1.23 The Repurposed CO_2 Connection Corridor follows the route of an existing underground gas pipeline and includes a buffer zone of up to 100 m width, avoiding above-ground structures and curtilages where possible. This pipeline forms approximately 3 km of an overall 27 km route between Connah's Quay Power Station and Point of Ayr Gas Terminal, to the north-west.

2.1.24 The Repurposed CO_2 Connection Corridor is largely comprised of agricultural fields (largely pastoral, with some arable in the western extents) lined by hedgerows. The Repurposed CO_2 Connection crosses beneath the A548, Leadbrook Drive, a private access road (twice), and the North Wales Main Line railway. The Repurposed CO_2 Connection crosses beneath Lead Brook and two other unnamed watercourses. There are two existing electrical pylons within the Repurposed CO_2 Connection Corridor, and the Repurposed CO_2 Connection crosses beneath the associated cable route once. There is one residential and one light-industrial property south of the North Wales Main Line railway within the Repurposed CO_2 Connection Corridor. A narrow strip of the Dee Estuary Ramsar site, SAC, SPA, and SSSI immediately north-west of the Main Site is within the Repurposed CO_2 Connection Corridor, where the Repurposed CO_2 Connection crosses underneath these designations.

2.1.25 The Repurposed CO_2 Connection Corridor is approximately 15.1 ha and approximately 25.4 m AOD (average).

Proposed CO_2 Connection Corridor

2.1.26 The Proposed CO_2 Connection Corridor is located east of Allt-Goch Lane and Llwyn Onn, and south of a private access road to a residential property. It is located south-west of the Repurposed CO_2 Connection Corridor.

2.1.27 The Proposed CO_2 Connection Corridor comprises two agricultural (arable) fields separated by a hedgerow and a small section of the single-track Allt-Goch Lane.

2.1.28 The Proposed CO_2 Connection Corridor includes proposed infrastructure for the HyNet CO_2 Pipeline Project that will be located within the same area. The Flint AGI (approximately 80 m × 80 m, and up to 5 m Above Ground Level (AGL)) to be located east of Llwyn Onn; and a 'Newbuild CO_2 Pipeline' – (approximately 400 m long, 610 mm diameter below ground pipeline) connecting the Flint AGI with an existing gas pipeline at approximate grid reference SJ253711. Based on anticipated timescales reported for the HyNet CO_2 Pipeline Project, this infrastructure is likely to be constructed and operational by the time the Proposed CO_2 Connection for the Proposed Development is installed (refer to Table 3.3 of the HyNet CO_2 Pipeline Project ES (Volume II) for information on the status of the HyNet CO_2 Pipeline Project[9]). There is potential for this programme to be delayed. As a worst-case assumption, the construction of the HyNet CO_2 Pipeline Project and the Proposed Development will be considered cumulatively (refer to **Chapter 21: Cumulative and Combined Effects** for further information).

2.1.29 The Proposed CO_2 Connection Corridor is approximately 130 m wide, 6.5 ha and approximately 50.1 m AOD (average).

Water Connection Corridor

2.1.30 The Water Connection Corridor is located north-east of the existing Connah's Quay Power Station, north of the existing National Grid 400 kV Deeside Substation, and extends approximately halfway into the River Dee; its north-east boundary runs between grid reference SJ282714 and SJ285711.

2.1.31 The Water Connection Corridor comprises both intertidal habitats (mudflat and saltmarsh) of the Dee Estuary and the River Dee itself, and is wholly within the associated Ramsar site, SAC, SPA, and SSSI. The Water Connection Corridor contains the existing cooling water intake (including eel screens) and outfalls and associated underground intake and outfall pipelines for the existing Connah's Quay Power Station CCGT generating station.

2.1.32 The Water Connection Corridor is approximately 10.5 ha and approximately 2.7 m AOD (average).

Electrical Connection Corridor

2.1.33 The Electrical Connection Corridor is located south-east of the existing Connah's Quay Power Station (Main Site), south and west of the River Dee/ Dee Estuary, and north of the A548.

2.1.34 The Electrical Connection Corridor contains the existing electrical export cables and the existing 400 kV National Grid Deeside Substation. Outside of these assets, the Electrical Connection Corridor is comprised entirely of hardstanding within the wider National Grid facility. This wider National Grid

[9] WSP, 2023; *Environmental Statement – Volume II – Chapter 3: Description of the DCO Proposed Development, HyNet Carbon Dioxide Pipeline DCO* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070007/EN070007-002845-D.6.2.3%20Chapter%2003%20-%20Description%20of%20the%20DCO%20Proposed%20Development%20Rev%20C%20(Clean).pdf (Accessed 13/12/2023)

facility includes 132 kV and 400 kV overhead lines as well as underground cables that serve existing substations. A separate 132 kV substation is located approximately 500 m east of the Connah's Quay Power Station site, south of the A548 and is owned and operated by Scottish Power Energy Networks (SPEN).

2.1.35 The Electrical Connection Corridor is approximately 3.4 ha and is approximately 7.3 m AOD (average).

Existing Natural Gas Connection Corridor

2.1.36 The Existing Natural Gas Connection Corridor is located between a point within the River Dee (SJ285711; due east of Connah's Quay AGI) and Burton Point AGI, north-west of the roundabout between the A548 and Weighbridge Road (SJ297720). Between these points, its route runs due east, west of the A548 and Deeside Power Station (approximately SJ293711), before diverting north-east to its endpoint.

2.1.37 The Existing Natural Gas Connection Corridor follows the route of an existing underground natural gas import pipeline (the 'Existing Natural Gas Connection'), which runs between the Connah's Quay AGI (within the Main Site) and the Burton Point AGI, and it includes the associated curtilage and unnamed access road which connects to a roundabout off the A548 for Burton Point AGI. The Existing Natural Gas Connection Corridor excludes where the Existing Natural Gas Connection is underneath the Main Site and the Water Connection Corridor. The southern extent of the Existing Natural Gas Connection Corridor comprises both the intertidal habitats (saltmarsh) east of the River Dee and the River Dee itself, and this area is within the associated Ramsar site, SAC, SPA, and SSSI. The northern extent of the Existing Natural Gas Connection Corridor is comprised of largely open grassland (non-agricultural) with small areas of woodland, and scrub vegetation surrounding the hardstanding/ roadway areas of the AGI.

2.1.38 The Existing Natural Gas Connection Corridor is approximately 5 ha and is approximately 7.6 m AOD (average).

Indicative Enhancement Area

2.1.39 The Indicative Enhancement Area is located south of the A548 (Flintshire Bridge), west and south-west of the River Dee, north-east of the North Wales Main Line railway, and south-east of the National Grid Deeside Substation.

2.1.40 The west and northern extents of the Indicative Enhancement Area comprise derelict hardstanding with scrub/ grass vegetation regrowth, while the southern and eastern extents comprise open grassland with scattered shrubs and small trees. The divide between these two is partially marked by a row of trees. Two existing electrical pylons and a building foundation are located near the eastern boundary of the Indicative Enhancement Area and one further existing electrical pylon is located on the southern border.

2.1.41 The Indicative Enhancement Area is approximately 12.8 ha and is approximately 6.9 m AOD.

2.1.42 The Indicative Enhancement Area will be accessed via existing internal access roads within the wider National Grid facility. This access runs from the B5129 Kelsterton Road at SJ282704 (north of Deeside Stadium), north-

west across the North Wales Main Line railway to SJ283705, before diverting south-east towards the Indicative Enhancement Area at SJ285704.

2.1.43 Collectively, these existing internal access roads in addition to the alternative access to the Main Site, is labelled 'Alternative Access to Main Site and Access to Indicative Enhancement Area' shown on **Figure 1-3 (Appendix A).** These comprise existing hardstanding only.

2.2 Site History

2.2.1 The Main Site and Indicative Enhancement Area were formerly occupied by saltings, areas of coastal land that are regularly covered by the tide. The first land to be developed was the area referred to in this report as the proposed Indicative Enhancement Area (see **Figure 1-3 (Appendix A)**).

2.2.2 Reclamation commenced in 1950 and included the dredging and pumping of 800,000 tons of sand from the river to lift the ground level to around 2.5 m AOD, thereby creating the development platform for the original coal-fired power station on the proposed Indicative Enhancement Area. It was constructed in three 60 MW phases over eight years, with completion in 1958.

2.2.3 Embankments were created on land currently occupied by the Main Site to provide settlement lagoons and storage for the slurried pulverised fuel ash (PFA) arising from the coal station. As well as three cooling towers, the original station was also served by a dedicated railhead, running from the North Wales coastline to the west of the Site.

2.2.4 The original coal-fired station ceased operating in 1984. Demolition started in 1992 and the proposed Indicative Enhancement Area was cleared of all standing structures. Subsurface holes and pits were filled in and wastes were disposed of to landfill. Since demolition, the Indicative Enhancement Area has remained mainly undeveloped.

2.2.5 A separate electrical substation was constructed to the north of the Indicative Enhancement Area in the 1970s. This land, (between the Main Site and Indicative Enhancement Area), is occupied by the existing National Grid 400 kV Deeside Substation, connected to the Main Site, and a 132 kV substation, operated by SPEN, a Distribution Network Operator (DNO).

2.2.6 The current four-unit combined CCGT and associated infrastructure (including GTP) was constructed between 1993 and 1996 in the south-east of the Main Site. The plant was constructed on the former PFA settlement lagoons which raised the site to its current height (maximum 7 m AOD) and the former coal-fired station site, the Indicative Enhancement Area, formed part of the laydown area. The station was initially owned by Powergen/ E.ON UK, and transferred to the Applicant in 2015. The current layout of the existing site is shown on **Plate 2-1**.

3. The Proposed Development

3.1 Overview

3.1.1 The Proposed Development comprises the demolition of an existing GTP, store buildings, and contractors' facilities on site, and the construction, operation, and maintenance of a CCGT generating plant with CCP with a net electrical output capacity of up to 1,380 MW to be located at the existing Connah's Quay Power Station, Flintshire, North Wales.

3.1.2 At this stage in the design of the Proposed Development, the final technology selection for the CCGT and CCP cannot be made, as it will be determined by various technical, economic considerations, and vendor selection, and will be influenced by future UK Government policy. The design of the Proposed Development, therefore, incorporates a necessary degree of flexibility in the choice of technology, to allow for the future selection of the preferred technology in the light of prevailing policy and market conditions once a DCO is granted.

3.1.3 It is not expected that the final vendors for the CCGT and CCP or construction details (e.g. construction methods and characteristics of the materials) will be selected until later stages of the Proposed Development. This is expected to be finalised after Final Investment Decision, which is expected to be contingent on securing the grant of a DCO. A Rochdale Envelope approach will therefore be required, to allow the Applicant to retain some necessary flexibility to allow different vendor equipment and construction approaches to be selected at a later date.

3.1.4 The assessments to be included within the EIA and presented in the ES will consider and assess the 'worst-case' impacts, in accordance with the Rochdale Envelope approach outlined in PINS Advice Note 9[10]. Potential areas that could be subject to change at this stage include the location, dimensions, orientation, and design of the following:

- single- or two-phase construction of CCGT generating plant and associated stack(s) buildings and equipment within the Main Site;
- number and heights/ dimensions of absorber columns (and associated stack(s) and equipment) within the Main Site;
- routing of Proposed CO_2 Connection within the Proposed CO_2 Connection Corridor;
- routing of the Electrical Grid Connection including whether it will be above or below ground within the Electrical Connection Corridor;
- cooling water intake and outfall structure(s) and connections within the Water Connection Corridor;
- the Proposed CO_2 AGI (if required);
- the construction laydown area; and

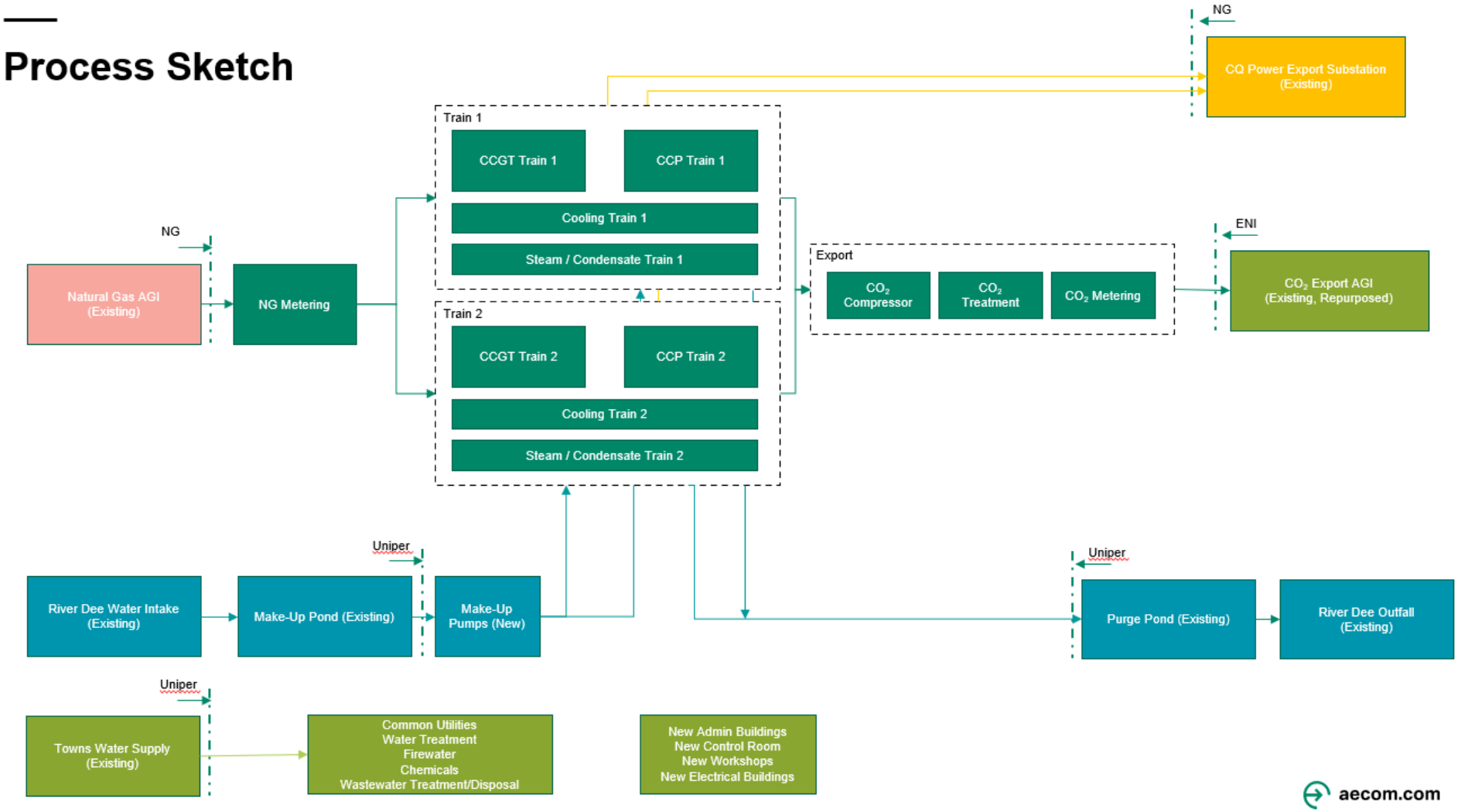
[10] PINS (2018). Advice Note 9: *Rochdale Envelope* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/ (Accessed 01/12/2023).

- area required for mitigation and/ or net benefits for biodiversity (NBB).

3.1.5 An overview of the key process components is shown in **Plate 3-1** and an indicative conceptual layout of the Proposed Development is provided in **Figure 1-3** (**Appendix A**). The layout will be developed following further engineering evaluation, consultation with stakeholders and considering the findings of further technical and environmental studies.

3.1.6 The following sections describe the various components of the Proposed Development.

Plate 3-1 Proposed Development Process Schematic



3.2 The Proposed Development

Main Site

Combined Cycle Gas Turbine Plant

3.2.1 In a CCGT power station, a gas fuel (typically natural gas, although other gaseous fuels can also be used) is combusted to drive gas turbine, which is connected to a generator producing electricity. Natural gas will be supplied to the proposed CCGT units through the Connah's Quay AGI. As an amount of usable heat remains in the gas turbine exhaust, this is passed into a Heat Recovery Steam Generator (HRSG, a type of boiler) to make steam to generate additional electricity via a steam turbine.

3.2.2 The waste gases from the heat recovery boiler are then typically released into the atmosphere via an exhaust stack, following appropriate treatment.

3.2.3 The exhaust steam from the steam turbine is condensed (cooled) back into water which is returned to the HRSG to continue the process. This cooling is achieved through the use of hybrid wet/ dry cooling towers using make up water that is abstracted from the River Dee (located adjacent to the north of the Main Site; refer to further description on the Water Connection Corridor below), although final design decisions in relation to cooling are yet to be made.

3.2.4 The electrical efficiency of a modern CCGT power station is considerably higher than that for a conventional coal, biomass or oil-fired generating plant, or many of the existing UK fleet of gas-fired power stations.

3.2.5 The Proposed Development is expected to comprise up to two new 'Trains' of CCGT plant (with a net electrical output capacity of up to 1,380 MW) with (post-combustion) CCP. Each Train comprises the assets required within the Main Site (downstream of the Connah's Quay AGI and upstream of the Existing GTP AGI or Proposed CO_2 AGI) for the CCGT plant with CCP to operate, including supporting infrastructure and staff facilities. It is anticipated that some supporting infrastructure and staff facilities will be shared between the two Trains. It is anticipated that the two Trains will be installed in a phased manner (referred to as Phase 1 and Phase 2, with regard to construction programme periods) and will be largely independent in operation. However, there is potential for Train 1 and Train 2 to be constructed in a single phase.

3.2.6 Under certain circumstances, such as emergency shutdown of the CCP plant, it may be necessary for combustion emissions to bypass the CCP and be emitted directly to atmosphere via a bypass stack for a limited period. These bypass stacks are anticipated to be circa 56 m AGL (indicative height). The CCGT and HRSG buildings are anticipated to have indicative heights of circa 32 m AGL and 42 m AGL respectively.

Post-Combustion Carbon Capture Plant

3.2.7 The Proposed Development will incorporate a CCP to facilitate the capture of CO_2 produced through the combustion of natural gas in the CCGT, the process for which is summarised in **Plate 3-1**.

3.2.8 The Applicant proposes that this would be facilitated through a (preferred) method of post-combustion amine stripping in a dedicated CCP; however, the technology choice is not fixed at this stage and alternative options may be sought.

3.2.9 Post combustion carbon capture involves capturing and cooling the exhaust gases from the CCGT units (potentially via a flue gas blower) and passing them through absorber column(s), containing a liquid amine-based chemical solvent, to absorb the CO_2 and remove it from the exhaust gases which are then released to atmosphere. The CO_2 rich solvent is heated and passed to a stripper column to liberate the CO_2 gas. The lean solvent is returned to the absorber column(s) to repeat the cycle.

3.2.10 The liberated CO_2 gas is then cooled and compressed. The Applicant proposes that the liberated CO_2 will be directed to either the Applicant's Existing GTP AGI or the Proposed CO_2 AGI, and exported from the Main Site via the Repurposed CO_2 Connection Corridor, for onward transfer and connection into the HyNet CO_2 Pipeline Project's CO_2 pipeline via the proposed Flint AGI (Hynet). Further descriptions are provided in the subsequent sections below.

3.2.11 The CCP is likely to consist of the following principal infrastructure:

- exhaust gas cooling and conditioning plant;
- flue gas blower/ centrifugal fans (may not be required);
- absorber column(s) including water and acid wash and associated stack(s);
- heat exchangers;
- solvent reclaimer tower;
- reboiler;
- lean and rich solvent storage tanks (to enable high capture rate during start-up);
- cooling provision for both the CCGT and CCP which is likely to comprise either through an air-cooled condenser array or additional hybrid cooling system including towers and associated infrastructure, subject to ongoing technical studies;
- chemical and waste storage facilities (including for hazardous materials);
- CO_2 cooling and compression plant;
- effluent treatment plant; and
- ducting and pipework.

3.2.12 In addition to the electrical generating plant, the following infrastructure is likely to be required:

- electrical control room and administration building;
- workshops;
- stores (including chemical tanks);
- fire pumps;

- cooling water pump house;
- above-ground raw and fire water tank;
- above-ground demineralised water tank;
- back-up generators, comprising skid-mounted units;
- staff offices and welfare facilities;
- additional internal access roads; and
- parking areas (including electric vehicle chargers).

3.2.13 These will be located within the Main Site and individual items listed above may be combined into fewer structures in the final design where appropriate from an operational perspective (e.g. administration, offices, and staff welfare).

3.2.14 The CCP will be located adjacent to the CCGT and HSRG. The tallest structure(s) will be the absorber tower(s) and associated stack(s) which are anticipated to be circa 105 m AGL indicative height. Other structures associated with the CCP are likely to be a similar indicative height to the CCGT units/ stacks described in paragraph 3.2.6.

3.2.15 The CO_2 compression area, as well as some storage and other balance of plant items, are expected to be shared between both Trains.

3.2.16 Following treatment, the CO_2 stream will be compressed for export, measured and transferred into either the Existing GTP AGI or the Proposed CO_2 AGI within the Main Site, then on to the Repurposed CO_2 Connection described below.

Above Ground Installations/On Site Utilities

3.2.17 The existing supply of natural gas via the Existing Natural Gas Connection is described in paragraph 2.1.7. The natural gas import will continue to enter the Main Site from the north-east. The existing Connah's Quay AGI will be upgraded to include a new tie-in, new gas filtering plant and a new pressure reduction station (PRS).

3.2.18 The export of CO_2 will be via a separate AGI. At this stage, it is assumed that the Existing GTP AGI, located in the north of the Main Site, could be repurposed, if possible, to allow for the export of CO_2 via the Repurposed CO_2 Connection Corridor. Upgrade work is required, and suitability of this location is to be confirmed as the design progresses. Alternatively, a new AGI, ('the Proposed CO_2 AGI'), may be required at a location within the Main Site and the Existing GTP AGI will be demolished.

3.2.19 The Main Site includes an existing electrical connection corridor including pylons supporting the existing 400 kV HV overhead line which runs approximately parallel to the south-west border of the Main Site. No works are proposed to the existing HV overhead line although its presence requires consideration for the layout of both permanent and temporary structures within the Main Site.

3.2.20 The terminal points of connections to existing potable/ towns water import and wastewater export utility connections are likely to be located within the Main Site.

Associated Development

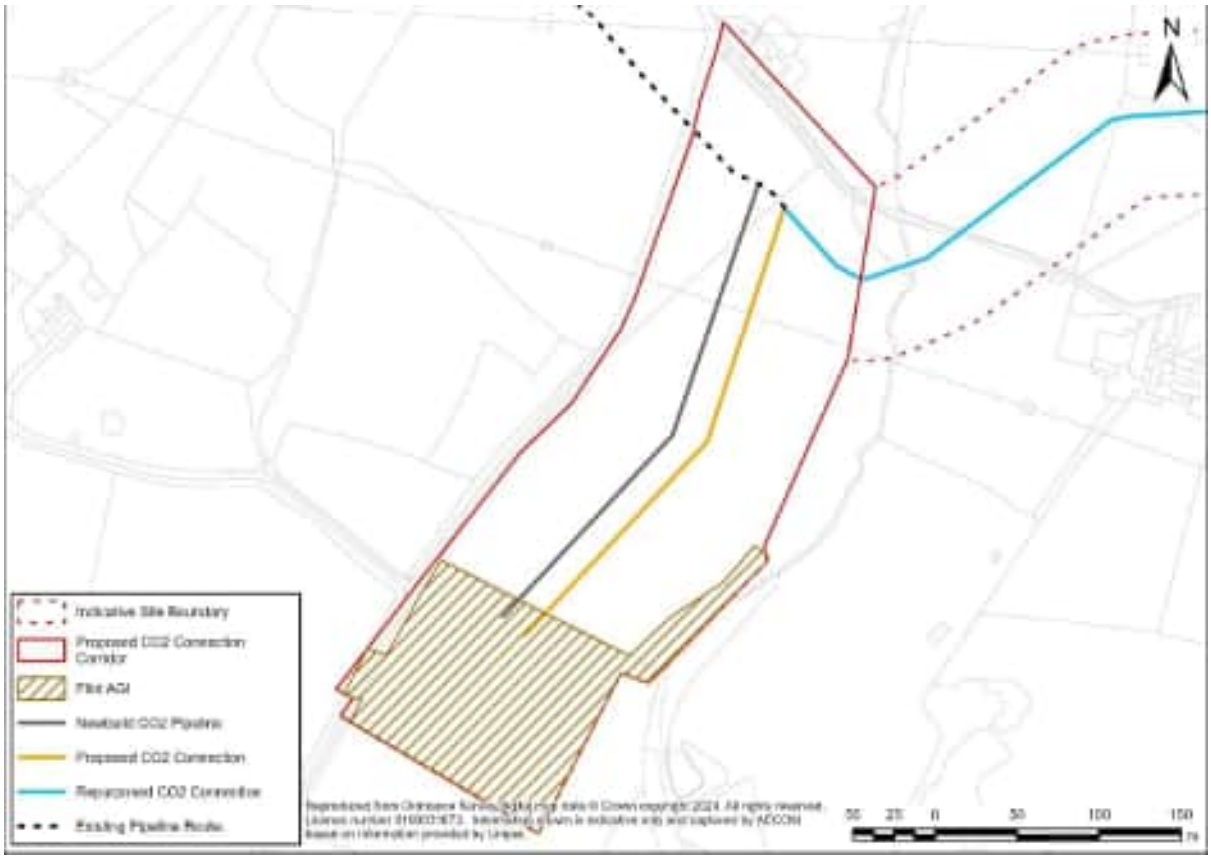
Repurposed CO_2 Connection Corridor

3.2.21 The export of CO_2 from the Existing GTP AGI or the Proposed CO_2 AGI (following metering and testing) will utilise the existing natural gas pipeline and will commence at the Existing GTP AGI or the Proposed CO_2 AGI within the Main Site. This pipeline (and potentially the Existing GTP AGI) will be re-purposed from natural gas transport for the purposes of CO_2 transport. This existing pipeline currently follows a route north-west and south-west of the Main Site, for approximately 27 km to the existing Point of Ayr Gas Terminal. Use of this pipeline for supply of natural gas ceased in 2023.

3.2.22 The Proposed Development will utilise approximately 3 km of the overall 27 km existing pipeline route (the 'Repurposed CO_2 Connection Corridor'). The remaining approximately 24 km of the existing pipeline route is to be repurposed as part of the HyNet CO_2 Pipeline Project. The Repurposed CO_2 Connection Corridor runs from the Existing GTP AGI generally west to a point south of Pentre Ffwrndan, east of Allt-Goch Lane. This routing is currently indicative and subject to ongoing technical studies. A 100 m corridor (50 m either side of the indicative centre line; the 'Repurposed CO_2 Connection Corridor') is included (avoiding above-ground structures and curtilages where possible). The Repurposed CO_2 Connection Corridor is shown on **Figure 1-3 (Appendix A).** No physical works will be required within the Repurposed CO_2 Connection Corridor, subject to assessment of the safety case. Works may be required to the Repurposed CO_2 Connection within the Main Site to connect to the Proposed CO_2 AGI and within the Proposed CO_2 Connection Corridor to connect to the Proposed CO_2 Connection.

3.2.23 The interfaces between the Proposed Development and the HyNet CO_2 Pipeline Project are shown in **Plate 3-2**.

Plate 3-2 Interface between the Proposed Development (Repurposed CO_2 Connection and Proposed CO_2 Connection) and HyNet CO_2 Pipeline Project (Flint AGI, Newbuild CO_2 Pipeline and Existing Pipeline Route).



Proposed CO_2 Connection Corridor

3.2.24 Captured CO_2 emissions from the Proposed Development will be discharged from the Repurposed CO_2 Connection Corridor, via a new circa 350 m pipeline spur (the Proposed CO_2 Connection) into Flint AGI (which is part of the proposed HyNet CO_2 Pipeline Project) and then into the HyNet CO_2 Pipeline[11], this is described above in 3.2.22.

3.2.25 The Proposed CO_2 Connection Corridor indicates the corridor in which the pipeline will be located. The pipeline is expected to be similar to the Repurposed CO_2 Connection (i.e. an approximately 610 mm diameter, below-ground pipeline). The final location and routing of the Proposed CO_2 Connection is subject to ongoing technical studies. A suitable corridor is shown on **Figure 1-3 (Appendix A)** to allow for flexibility in the routeing of the pipeline and for construction laydown and access routes.

3.2.26 It is proposed that the Proposed CO_2 Connection Corridor will interface with a new CO_2 pipeline at the Flint AGI – a proposed AGI to be developed as part of the HyNet CO_2 Pipeline Project by Liverpool Bay CCS Limited. The proposed Flint AGI and access has been included within the Proposed CO_2 Connection Corridor. Works associated with connecting the Proposed CO_2 Connection to the Flint AGI are subject to ongoing studies and will be considered in the ES.

[11] The Hynet CO_2 Pipeline will consist of a new pipeline running from the Chester/ Ellesmere Port area to Flint and a repurposed existing pipeline (currently used for natural gas supply) running from Flint to Point of Ayr. Examination of the HyNet CO_2 Pipeline DCO application closed in September 2023, and a decision is expected from the SoS in March 2024

3.2.27 Liverpool Bay CCS Limited proposes to repurpose existing redundant gas infrastructure and develop new infrastructure to allow the existing underground pipeline between Flint AGI and the Point of Ayr Gas Terminal to be repurposed and re-used to transport captured CO_2 from existing industrial sources in North-West England and North Wales for secure permanent storage in depleted oil and gas fields in Liverpool Bay. Liverpool Bay CCS Limited has submitted an application for a DCO (the HyNet CO_2 Pipeline Project) in respect of the onshore CO_2 transport and storage (T&S) network and a decision is expected from the SoS in March 2024, in addition to separate TCPA applications for the offshore T&S elements and onshore block valve stations.

3.2.28 Liverpool Bay CCS Limited would be responsible for the construction, operation and decommissioning of this CO_2 gathering network (the HyNet CO_2 Pipeline Project and offshore T&S network). The Hynet CO_2 Pipeline would not form part of this Application but is the subject of separate consent applications[12] by third parties. An assessment of potential likely cumulative effects on the basis of available information will be considered in the Applicant's ES.

Water Connection Corridor

3.2.29 Cooling water for the Proposed Development will be abstracted from and discharged to the River Dee, in-line with the current process for the existing Connah's Quay Power Station CCGT. Cooling water abstraction and discharge will be limited to periods around high water in line with the current abstraction permit.

3.2.30 The Proposed Development may utilise the existing cooling water abstraction and discharge infrastructure or, may require additional/ new abstraction and discharge infrastructure. The Water Connection Corridor shown on **Figure 1-3 (Appendix A)** covers the maximum area external to the Main Site within which the construction and operation of existing and potentially new cooling water infrastructure may be required and will be further refined as the design and EIA studies progress.

3.2.31 Eel screens are currently fitted on the existing cooling water intake. These will need to be replaced on the existing infrastructure or may be required for the new infrastructure to meet current legislative requirements including The Eels (England and Wales) Regulations 2009[13] ('Eels Regulations'). The replacement or installation of new eel screens will be considered within the ES and within any DML that forms part of the draft DCO (refer to Section 1.6).

Existing Natural Gas Connection Corridor

3.2.32 The import of natural gas to the CCGT plant upstream of the existing Connah's Quay AGI will use the Existing Natural Gas Connection – an existing 750 mm, approximately 2.5 km long natural gas pipeline from the Applicant's existing Burton Point AGI located approximately 1.6 km north-east of the Main Site, immediately off the A548 Weighbridge Road junction.

[12] WSP, 2023; *HyNet Carbon Dioxide Pipeline Examination Library - D.2.10 AGI Location Plans* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070007/EN070007-000191-D.2.10 - AGI Location Plans Rev A.pdf (Updated 22 September 2023).
[13] The Eels (England and Wales) Regulations 2009 (SI 2009/3344). London: HMSO.

The pipeline is owned and operated by the Applicant. National Grid also operates apparatus related to metering and valving at the Burton Point AGI.

3.2.33 The Existing Natural Gas Connection crosses beneath the proposed Water Connection Corridor. A 20 m buffer (10 m either side) has been applied to the route of the Existing Natural Gas Connection north-east of the Water Connection Corridor. This buffer, combined with the Burton Point AGI and curtilage, forms the Existing Natural Gas Connection Corridor, as shown on **Figure 1-3 (Appendix A)**.

3.2.34 No construction or maintenance works are expected to be required to the existing Natural Gas Connection as part of the Proposed Development and any works at Burton Point AGI are expected to be within the curtilage of the existing AGI and comprise the use of existing controls (i.e. for isolation of the downstream pipeline). The Burton Point AGI has been included in the Site Boundary to secure access under the DCO powers if required.

Electrical Connection Corridor

3.2.35 A new connection will be required from the Proposed Development CCGT Trains to Uniper's existing 400 kV banking compound. The existing electrical connection from the Applicant's 400 kV banking compound is expected to be used to connect the Proposed Development to the existing Deeside 400 kV Substation located south-east of the Main Site. This connection is yet to be finalised and is subject to ongoing feasibility studies. The potential route connection options currently under consideration are shown on **Figure 1-3 (Appendix A).** Alternative route options that are being considered will be presented and assessed in the ES where flexibility in the final routing is to be sought by the Applicant.

Indicative Enhancement Area

3.2.36 The Indicative Enhancement Area shown on **Figure 1-3 (Appendix A)** may require enabling works including the breaking up and removal of hardstanding, concrete, metal and railway sleepers, among other materials and may be used for temporary laydown during construction of the Proposed Development. Following construction, the Indicative Enhancement Area may be used for NBB measures. The Indicative Enhancement Area is accessed via the Alternative Access to Main Site and Access to Indicative Enhancement Area. This access may require minor road improvement works within the areas of existing hardstanding.

3.3 Construction Activities

3.3.1 The key construction activities are focused on the Main Site, the Proposed Connection CO_2 Connection Corridor, the Water Connection Corridor and the Electrical Connection Corridor.

3.3.2 It is not anticipated that any upgrades to existing pipelines along the Existing Natural Gas Connection Corridor or the Repurposed CO_2 Connection Corridor, beyond the scope of routine maintenance, will be required during construction of the Proposed Development. If minor modernisations are required during the construction or operation/ maintenance phase, the necessary work will likely only be carried out within the fence boundary of an AGI.

The Main Site

Site Clearance and Remediation

3.3.3 The Main Site will require site clearance and remedial works prior to the construction of the Proposed Development.

3.3.4 An existing GTP and contractors' facilities building currently located on the Main Site will be demolished prior to the construction of the Proposed Development.

3.3.5 The Proposed Development is part of a long-term replacement strategy for the existing CCGT on the Main Site. The demolition of the existing CCGT is not required for the construction of the Proposed Development. The environmental topics within the ES will assess the worst-case scenario on a topic-by-topic basis as relevant for the assessment. For some potential impacts and receptors, the worst-case will consider that some units of the existing CCGT may continue to operate for a period of time alongside the Proposed Development. Further information on this will be provided in the ES.

3.3.6 It is assumed that the above and below ground structures currently on the Main Site will be removed, cleared and remediated to a suitable development platform level. where this is required for the Proposed Development.

3.3.7 The Main Site is located within the curtilage of the existing Connah's Quay Power Station. Given the nature of the former site operations, it is possible that subsurface contamination may be present. Accordingly, a soil and groundwater investigation would be undertaken prior to commencing construction. The design and extent of this investigation would be based on the final design for the Proposed Development and would be conducted to also provide the necessary information to inform the requirements of an Environmental Permit that is required by NRW for the operation of the Proposed Development.

3.3.8 A technical study to assess the risk of flooding at the Main Site is underway and will inform the flood risk assessment that will accompany the Application. It is currently anticipated that some targeted ground raising may be required to increase ground levels above the existing average ground height of between 6.8 m to 7.0 m AOD in order to protect critical operational infrastructure from flood events and considering the effects of climate change.

3.3.9 The estimated volume of material required to undertake any targeted land raising to mitigate flood risk will be reported in the ES. The ES will describe the anticipated cut and fill volumes, spoil movements, minimum and, where relevant, maximum final ground heights and the associated impacts (e.g. construction traffic volumes).

Construction Laydown Areas

3.3.10 Proposed laydown areas required temporarily during construction of the CCGT and CCP will be located within the Main Site. The Main Site laydown areas will include equipment and material storage, site offices/ welfare

facilities, batch concrete facilities, soil storage/ waste handling areas etc and internal temporary access routes and parking areas.

3.3.11 There will be additional laydown areas at various locations to facilitate the construction of the connections associated with the Proposed Development, including potentially the Indicative Enhancement Area. These laydown areas will be used for the temporary storage of materials, fabrication, welfare facilities etc. and are further described below.

3.3.12 Proposals for protection of retained vegetation, soil protection and handling, and temporary soil storage will be specified in the Final Construction Environmental Management Plan (CEMP) prepared by the relevant contractor.

Access

3.3.13 Access to the Main Site for construction and operational traffic will likely be via the existing site access from Kelsterton Road from the A548. The location of the access is included within the Site Boundary on **Figure 1-3 (Appendix A).** Further technical studies are ongoing to consider likely construction traffic routes and access points including the potential requirement for any additional access points from the Kelsterton Road roundabout and the potential for direct access from the A548 to the existing roundabout on Kelsterton Road, shown as 'Access to Main Site' on **Figure 1-3 (Appendix A)**. Where relevant, further information on these alternatives will be provided in the ES.

3.3.14 Light goods vehicles (LGV) and cars may also access the Main Site via the proposed Alternative Access to Main Site and Access to Indicative Enhancement Area located to the south-east of the Main Site via the B159 Kelsterton Road south of the existing National Grid 400kV Deeside Substation, as shown on **Figure 1-3 (Appendix A).** These access roads may require minor upgrade works to ensure they are suitable for use for the operational phase of the Proposed Development. This Alternative Access to Main Site and Access to Indicative Enhancement Area would not be used for heavy goods vehicles (HGV) during either construction or operational phases.

3.3.15 Minor works may also be required to existing access tracks to the north-east and north-west of the Main Site in order to maintain suitable access to existing wildlife hides, shown as the 'Access to Wildlife Hides' on **Figure 1-3 (Appendix A).** The areas shown are located entirely within the existing areas of hardstanding within the Dee Estuary Nature Reserve.

3.3.16 Minor works may also be required to existing access tracks to the north of the Main Site in order to maintain suitable access to the Existing Surface Water Outfall shown on **Figure 1-3 (Appendix A)**. This Existing Surface Water Outfall may require maintenance or minor upgrade works to the existing artificial structure only. A 10 m buffer around the artificial structure has been included to allow for access and works if required. The Existing Surface Water Outfall is located within the Dee Estuary Nature Reserve.

3.3.17 During the detailed design stage, the approach to construction will be refined. A number of routes are under consideration to be used for the shipborne delivery of large plant and equipment (abnormal indivisible loads

(AIL)) during construction of the Proposed Development. Further detail will be provided in the ES. These AIL would be transported to the Main Site using the existing road network. The strategy and routes for delivery of AIL will be subject to further assessment to determine any modifications that may be required to existing infrastructure to allow conveyance of the largest AIL. Powers for such works may be sought in the DCO and, where this is the case, the ES will assess the impacts and effects of any proposed modifications.

Proposed CO_2 Connection Corridor

3.3.18 It is expected that the Proposed CO_2 Connection will be constructed in the same way as a natural gas transmission pipeline, involving excavation of an open trench (to provide a depth of cover, typically 1.2 m), lowering of the pipe into the trench and backfilling with the excavated material. Topsoil will be removed and stored separately to the subsoil. Construction works will generally be contained within a fenced working area. Any surplus excavated material will be reused on site, where possible.

3.3.19 The ground will be reinstated after construction, to allow continued agricultural use. Existing vegetation lost/ disturbed will be replanted and replaced.

Water Connection Corridor

3.3.20 The existing cooling water abstraction pipework and associated infrastructure in the River Dee (in use for Connah's Quay Power Station) is likely to need to be upgraded to enable compliance with the Eels Regulations. Alternatively, it may be necessary to replace existing intake and outfall structures.

3.3.21 Installation of a cofferdam may be required during the construction phase of the Proposed Development, to provide a safe, dry and stable working area for cleaning of existing structures, to inform the detailed design of works required to upgrade or reconstruct the existing infrastructure, and for any construction/ upgrade works.

3.3.22 There will be no capital dredging required as part of the construction works. If maintenance dredging is required around the intakes, it is assumed that this will be considered within any DML that forms part of the draft DCO (refer to Section 1.7).

Electrical Connection Corridor

3.3.23 The timing, location and construction of the electrical grid connection will be determined in consultation with National Grid. These discussions will be ongoing as the preparation of the Application progresses. At this stage in the design development, it is envisaged that the electrical grid connection will be largely below ground, downstream of a short above-ground section immediately adjacent to the Main Site. The existing electrical grid connection may be reused for the Proposed Development.

Indicative Enhancement Area

3.3.24 The Indicative Enhancement Area may require enabling works if it is to be used for planting for mitigation or enhancement. This may potentially include the breaking up and removal of hardstanding, concrete, metal and railway sleepers etc. Further information on this will be provided in the ES.

3.4 Construction Programme and Management

3.4.1 Subject to being granted development consent and following a final investment decision, it is anticipated that construction of a single CCGT and CCP together with cooling and CO_2 compression infrastructure and associated development (herein referred to as 'Train 1, Phase 1'), could commence in 2026, and last approximately four years. If progressed, the construction of an identical CCGT and CCP together with cooling infrastructure and associated development (herein referred to as 'Train 2, Phase 2'), could commence in 2031 and last approximately four years. These dates are indicative. There is potential for Train 1 and Train 2 to be constructed during a single phase. The ES will provide further information of the proposed construction activities and their anticipated duration, along with an indicative programme of each phase of the works, and the potential combined single phase, for both Train 1 and Train 2.

3.4.2 The demolition of the GTP and contractors' facilities on the Main Site will take place prior to construction works commencing. The timing of the demolition and associated activities required will be detailed further in the ES.

3.4.3 The ES will be accompanied by a Framework CEMP, which will describe the specific mitigation measures to be followed to control and reduce impacts on the environment during the construction phase. The Framework CEMP will be developed taking into account the environmental assessments, including mitigation measures, presented in the ES and will include, but not be limited to, impacts from:

- construction traffic (including parking and access requirements);
- earthworks;
- noise and vibration
- dust generation; and
- waste generation.

3.4.4 A final detailed CEMP will be secured as a requirement of any DCO that is granted and will identify the relevant procedures to be adhered to by the throughout construction.

3.4.5 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations and current guidance with the intention that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including:

Control of Pollution Act 1974 (COPA)[14], Environment Act 1995[15] and Hazardous Waste (England and Wales) Regulations 2005[16].

3.4.6 All construction works will adhere to the Construction (Design and Management) Regulations 2015[17] (CDM Regulations 2015).

3.5 Site Restoration/ Reinstatement

3.5.1 Assuming that Train 1/ Phase 1 construction of the Proposed Development commences in 2026 and lasts up to four years, restoration and reinstatement activities for land that is temporarily disturbed could commence from 2030 although earlier reinstatement/ restoration may be possible in the Water Connection Corridor, Electrical Connection Corridor and Proposed CO_2 Connection Corridor, depending on the construction activities that may be required for Phase 2.

3.5.2 Following construction, plant and equipment will be removed and existing ground reinstated. Topsoil would be reinstated where this has been stored during construction following topsoil stripping. The overall objective will be to leave the areas of the Site required only for construction with no residual environmental and/ or safety risks and return the land to a condition suitable for re-use. Landscaping and ecological management will be provided as appropriate. Technical work will be undertaken as part of the Application to quantify the change in biodiversity units predicted to arise from the Proposed Development, and to determine the Net Benefits for Biodiversity (NBB) that can be achieved via habitat enhancement and creation.

3.6 Staffing

3.6.1 Construction of the Proposed Development could take place in one or more phases. In the event that two phases are adopted, based on initial estimates, it is considered that there could be approximately 1,000 workers contracted to work on the Main Site at the peak of construction for each phase (Phase 1 or 2). If a single phase approach is adopted for construction of both Train 1 and 2, it is anticipated that peak construction numbers could be approximately 1,600 workers.

3.6.2 In addition to workers for the Main Site, there would also be vehicle movements associated with the other key elements of the Proposed Development, including, Proposed CO_2 Connection Corridor, Water Connection Corridor, Electrical Connection Corridor, and Indicative Enhancement Area. These figures will be reported within the ES. Indicatively, it is estimated that during construction of the Proposed CO_2 Connection Corridor, up to ten workers could be contracted, including supervision.

3.6.3 The ES will consider the maximum number of construction workers likely during peak construction.

[14] *Control of Pollution Act 1974* (c.40). London: HMSO.
[15] *Environment Act 1995* (c.25). London: HMSO.
[16] *The Hazardous Waste (England and Wales) Regulations 2005* (SI 2005/894). London: HMSO.
[17] *The Construction (Design and Management) Regulations 2015* (SI 2015/15). London: HMSO.

3.6.4 During the operational phase, it is envisaged that circa 66 permanent operational roles would be created when both Trains (Phase 1 and 2, or combined single phase) are operating.

3.6.5 During major outages, which are likely to occur approximately every four years (per unit), it is envisaged that there could be up to 300 additional staff although these are short-term requirements (approximately two months).

3.7 HGV Movements and Traffic

3.7.1 The principal vehicle movements are anticipated to be associated with the construction phase of the Proposed Development.

3.7.2 The volume of construction vehicles (HGV and workers) is subject to ongoing technical studies; however, based on approximately 1,000 workers during the peak of construction for either Phase 1 and 2 on the Main Site, this could equate to approximately 1,016 two-way daily vehicle movements (508 in and 508 out) during the peak of construction, including 200 HGV movements (100 in and 100 out) and 816 LGV / car movements (408 in and 408 out).

3.7.3 If a single phase approach is adopted for construction of both Train 1 and 2, based on approximately 1,600 workers during the peak of construction for the single phase, this could equate to approximately 1,500 two-way daily vehicle movements (750 in and 750 out) during the peak of construction, including 200 HGV movements (100 in and 100 out) and 1,300 LGV / car movements (650 in and 650 out).

3.7.4 These figures are indicative and will be revisited in the ES to ensure vehicle movements associated with the other key elements of the Proposed Development, including, Proposed CO_2 Connection Corridor, Water Connection Corridor, Electrical Connection Corridor, and Indicative Enhancement Area, are considered and to consider numbers in the event that a single construction phase approach for both Train 1 and Train 2 is adopted.

3.7.5 Once operational, it is anticipated that the circa 66 staff will be required on a shift basis to be spread over a 24-hour period. Conservatively, this could equate to an additional 132 vehicle movements (i.e. 66 vehicles in/ out accessing the Site per day).

3.7.6 Vehicle movements associated with the planned maintenance outages will be considered in the ES. A worst-case staff attendance for such activities could be up to 300 workers. These events are managed and occur at the frequency of around once every four years, and they last around two months or 60 days, as a representative period.

3.7.7 Once operational, there is potential that up to seven HGV (tankers) of wastewater would be removed from Site per day, equating to an additional 14 HGV movements (seven entries and seven exits). This represents a worst-case scenario in the absence of suitable water treatment within the Site. The provision of wastewater treatment within the Site and the corresponding number of HGV tanker movements required will be determined at a later stage of design.

3.7.8 Natural gas will be delivered by pipeline and other operational and maintenance consumables will be managed to be kept as low as is reasonably practicable, thereby minimising traffic movements.

3.8 Lighting

3.8.1 Some external lighting will be required to ensure the CCGT and CCP and associated infrastructure can operate safely at all times. An Indicative Lighting Strategy will be prepared and submitted as part of the Application. This will then inform the preparation of an external lighting scheme under a DCO requirement which will be designed in accordance with relevant standards, such as the Guidance Notes for the Reduction of Obtrusive Light (2021) published by the Institute of Lighting Engineers and/or Chartered Institution of Building Services Engineers (CIBSE) requirements, as appropriate. The strategy will seek to ensure that safe working conditions are provided whilst reducing light pollution and the visual impact of light on the local environment.

3.9 Environmental Management During Operation

3.9.1 The Proposed Development will require an Environmental Permit and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016 so that any impacts of emissions to air, soil, surface and groundwater, to the environment and human health will be minimised and avoided using Best Available Techniques (BAT) as far as reasonably practicable. Whether a new permit, or a variation to the Applicant's existing permit, is progressed will be discussed and agreed with NRW and parallel submission of the permit (or variation) application with or shortly after the Application is proposed.

3.9.2 The Proposed Development will be operated in line with appropriate standards and the operator will implement and maintain an Environmental Management System (EMS) which will be certified to International Organisation for Standardisation (ISO) 14001[18]. The EMS will outline requirements and procedures required to ensure that the Proposed Development Site is operating to the appropriate standard.

3.9.3 Any requirements for sampling and analysis of pollutants will be undertaken where required in accordance with the Environmental Permit.

3.10 Decommissioning

3.10.1 Each Train of the CCGT with CCP (or combined single phase) is expected to have a design life of circa 30 years. It is expected that the Proposed Development will have some residual life remaining, and an investment decision would then be made based on the market conditions prevailing at that time. If the operating life were to be extended, the Proposed Development would be upgraded in line with the legislative requirements at that time. The same timescales would apply for the pipeline and utility connections.

3.10.2 At the end of its operational life, the most likely scenario would be that the Proposed Development would be shut down, with all above ground

[18] ISO, 2015; *ISO 14001:2015 Environmental management systems: Requirements with guidance for use*. Geneva: ISO.

structures on the Main Site removed, and the ground remediated as required to facilitate future re-use.

3.10.3 It is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impacts; however, this will be assessed where practicable within the ES. It is generally assumed that the environmental effects associated with the decommissioning phase would be no worse than those experienced during construction and these will be assessed on this basis.

4. Project Alternatives and EIA Methodology

4.1 Introduction

4.1.1 The EIA Regulations require that an ES should include an outline of the main alternatives that have been studied by the Applicant and an indication of the main reasons for its choices, taking into account the likely significant environmental effects of each alternative. Under the EIA Regulations there is no requirement to assess alternatives, only a requirement to provide a review of those alternatives that have been considered.

4.1.2 Technology options for the Proposed Development have been assessed in order to select the current concept of CCGT with CCP. A screening review was carried out of all possible technologies which could provide low-carbon dispatchable power within the timeframe under consideration. These were shortlisted based upon a technoeconomic assessment including infrastructure availability at Connah's Quay and both technical and commercial maturity.

4.1.3 For the Proposed Development, alternative development locations on the Site are being evaluated. It is proposed that other project alternatives will be considered as the DCO application progresses, including:

- the low-carbon technology to be selected;
- the layout of the Proposed Development including the choice and configuration of the CCGT units;
- the cooling options including upgrade or replacement of existing infrastructure;
- the route corridors for connections for CO_2, electricity and gas networks;
- access considerations to the Main Site for AIL; and
- sites for biodiversity enhancement.

4.1.4 Where alternatives are examined and assessed during the application process, information of the potential options and reasons for selection (or otherwise) will be included within the ES. Where, at the time of submission of the Application for development consent, alternatives are still necessary for any particular element of the Proposed Development, the EIA will consider and assess the 'worst case' impacts of the alternative options, in accordance with the Rochdale Envelope approach that is often applied in planning applications and is outlined in the PINS Advice Note 9.

4.2 The EIA Process

4.2.1 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.

4.2.2 The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of changes to the design, including any mitigation

measures that are incorporated during the EIA. This will be particularly important for the Proposed Development as the design and layout is still being refined, and minor changes are likely to be made following submission of this EIA Scoping Report.

4.2.3 The current environmental and physical conditions of the Site ('the baseline') will need to be established so that a comparison of future changes as a result of the Proposed Development can be understood, and potential likely significant effects can be identified.

4.2.4 The EIA will assess the following assessment scenarios:

- construction: effects associated with the construction activities required for the Proposed Development (worst-case scenario based on peak construction activity, including enabling and demolition works). The possible construction timescales are discussed in Section 3.4;
- operation: effects associated with the operation of the Proposed Development following completion of construction. Operational life is anticipated to be 30 years for each Train;
- decommissioning: effects associated with the decommissioning of the Proposed Development. Decommissioning is expected to last approximately two years for each Train; and
- cumulative: arising during either construction, operation or decommissioning, when the effects of the Proposed Development are considered with 'other developments' proposed within the study areas and the same timeframe.

4.2.5 The EIA is based on the following related activities:

- establishing existing baseline conditions and reviewing available data;
- identifying potential significant issues through scoping;
- consultation with statutory and non-statutory consultees throughout the DCO application process;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly available information and databases;
- physical surveys and monitoring;
- desk-top studies;
- computer modelling;
- reference to current legislation and guidance; and
- specialist opinion.

4.2.6 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and

negligible). For the purpose of the EIA, moderate and major effects will be deemed 'significant'.

4.2.7 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the project development.

4.3 Structure of the ES

4.3.1 The ES will address the direct effects of the Proposed Development in addition to the likely indirect, cumulative, short, medium and long term, permanent, temporary, beneficial and adverse effects. The mitigation measures required to prevent, reduce or, where possible, offset significant adverse effects will also be described. The concluding chapters will provide a summary of the cumulative and combined effects and likely significant residual environmental effects.

4.3.2 The ES will comprise the following set of documents:

- Non-Technical Summary: this document will provide a summary of the key issues and findings of the EIA in non-technical language;
- Volume I: Environmental Statement: this will contain the full text of the EIA and will include the following chapters:
  - Introduction;
  - The Proposed Development;
  - Description of the Existing Environment;
  - Project Alternatives;
  - Planning Policy and Need;
  - EIA Methodology;
  - Consultation;
  - Air Quality;
  - Noise and Vibration;
  - Traffic and Transport;
  - Terrestrial and Aquatic Ecology;
  - Marine Ecology;
  - Water Environment and Flood Risk;
  - Geology and Ground Conditions;
  - Landscape and Visual Amenity;
  - Physical Processes;
  - Cultural Heritage;
  - Socio-Economics, Recreation and Tourism;
  - Climate Change;

  - Human Health;
  - Major Accidents and Disasters;
  - Materials and Waste;
  - Cumulative and Combined Effects; and
  - Summary of Likely Significant Environmental Effects.
- Volume II: Technical Appendices: these will provide supplementary information of the environmental studies conducted during the EIA including relevant technical reports, background data, surveys, figures and photographs. The following assessments will be appended to the ES:
  - Net Biodiversity Benefit Assessment;
  - Habitats Regulations Assessment;
  - Water Framework Directive Screening Assessment; and
  - Flood Consequences Assessment.
- Volume III: Figures.

4.4 Structure of Technical Chapters

4.4.1 Technical chapters scoped into the EIA will be structured based on the following sub-headings:

Introduction

4.4.2 The Introduction will describe the format of the assessment presented within the chapter.

Legislation and Planning Policy Context

4.4.3 The Legislation and Planning Policy Context section of the technical chapters will provide an overview of the relevant legislation, planning policy and technical guidance relevant to the assessment.

Assessment Methodology and Significance Criteria

4.4.4 The methods used in undertaking the technical assessments will be outlined in this section with references to published standards (e.g. British Standards (BS), Building Research Establishment (BRE)), guidelines (e.g. Design Manual for Roads and Bridges (DMRB) and Institute of Environmental Management and Assessment (IEMA) guidelines) and relevant significance criteria.

4.4.5 The significance of effects before and after mitigation will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not practicable to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgement. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.

4.4.6 Specific criteria for each technical assessment will be developed, giving due regard to the following:

- extent and magnitude of the impact;
- impact duration (whether short, medium or long);
- impact nature (whether direct or indirect, reversible or irreversible);
- whether the impact occurs in isolation, is cumulative or interactive;
- performance against environmental quality standards where relevant;
- sensitivity of the receptor; and
- compatibility with environmental policies and standards.

4.4.7 For issues where definitive quality standards do not exist, significance will be based on the:

- local, district, regional or national scale or value of the resource affected;
- number of receptors affected;
- sensitivity of these receptors; and
- duration of the impact.

4.4.8 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following terminology will be used throughout the ES to define effects:

- "Beneficial, Negligible or Adverse" significance or "No Impact / Effect".
  - adverse – detrimental or negative effect to an environmental resource or receptor;
  - beneficial – advantageous or positive effect to an environmental resource or receptor; and
  - negligible – imperceptible effect to an environmental resource or receptor.
- for effects described as Beneficial or Adverse, define significance level as "Minor, Moderate or Major".
  - minor – slight, very short or highly localised effect of no significant consequence;
  - moderate – more than a slight, very short or localised effect (by extent, duration or magnitude) which may be considered significant; and
  - major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.
- duration of effect is also considered, with more weight given to permanent changes than to temporary ones. Permanent effects are generally those associated with the completed Proposed Development. Temporary effects are those associated with the construction works. For the purposes of this assessment, short-term effects are of one year or less, medium-term effects of one to five years and long-term effects for durations over five years each technical chapter may define these durations differently based on topic specific guidance / best practice; and

- local level (on-site or neighbouring site); District/County level (i.e. within FCC); regional level (within north-east Wales or North Wales); or National level (Wales or UK); or international level (UK and wider).

4.4.9 As indicated above, for the purpose of this EIA, moderate and major effects will be deemed 'significant', and, where possible, mitigation measures will be identified to reduce the residual effects to 'not significant'.

4.4.10 Each of the technical chapters will provide the criteria, including sources and justifications, for quantifying the different levels of residual effect. Where possible, this has been based upon quantitative and accepted criteria (for example, the National Air Quality Strategy objectives[19] or noise assessment guidelines[20]), together with the use of value judgement and expert interpretation to establish to the scale of an effect.

4.4.11 An example of a matrix used to derive the significance of an effect is given in **Table 4-1.**

Table 4-1 Example matrix to derive significance of an effect

Sensitivity or value of resource / receptor	Magnitude of impact			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

Study Areas

4.4.12 The study areas for the Proposed Development are individually defined for each environmental topic based on the geographical scope of the potential impacts on receptors and the relevant topic specific criteria. The study areas for each topic are further described in Chapters 6 to 21.

Baseline Conditions

4.4.13 In order to assess the potential impacts and effects of the Proposed Development, it is necessary to determine the environmental conditions that currently exist on site and in the surrounding area, for comparison. These are known as the 'existing baseline conditions'. Baseline conditions are determined using the results of site surveys and investigations or desk-based data searches, or a combination of these, as appropriate.

4.4.14 'Future baseline conditions', which are the likely future conditions in the study area in the absence of the Proposed Development, will also be considered and described.

4.4.15 For the purposes of assessment, each chapter will identify a reasonable 'worst-case scenario' with regards these future baseline scenarios.

[19] Welsh Government, 2020; *The Clean Air Plan for Wales* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf (Accessed 20/12/2023).
[20] IEMA, 2014; *Guidelines for Environmental Noise Impact Assessment Version 1.2*. March: IEMA.

Embedded Mitigation

4.4.16 Measures that have been integrated into the Proposed Development in order to avoid or reduce adverse environmental effects will be described. Such measures may include refinement of the design and layout of the Proposed Development to avoid impacts on sensitive receptors, implementation of the CEMP, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects will take account of these measures already being in place.

Potential Effects

4.4.17 This section will identify the likely impacts resulting from the Proposed Development. The magnitude of impacts is defined with reference to the relevant baseline conditions (existing or future, as appropriate), and the value of the receptor or receiving environment. The environmental effects are determined in accordance with the identified methodology.

Additional Mitigation and Enhancement Measures

4.4.18 The Additional Mitigation and Enhancement Measures section will consider the standard mitigation hierarchy (i.e. avoidance, reduction and compensation) in describing the measures that will be implemented by the Applicant to reduce any significant adverse effects identified by the assessment and to enhance beneficial effects during construction, operation, and decommissioning of the Proposed Development. A Schedule of Commitments will accompany the Application.

Residual Effects and Monitoring

4.4.19 The EIA Regulations make provision for post-consent monitoring of significant adverse effects on the environment in appropriate cases. Where post-consent monitoring is considered necessary to secure the success of mitigation measures, this will be described and included in the Schedule of Commitments (ES Volume II). The Applicant will work with the relevant responsible authorities to develop an appropriate monitoring plan, where required. A monitoring strategy will be contained in the ES and there will be clear objectives outlined for the significant environmental effects following mitigation.

Residual Effects and Summary

4.4.20 Effects of the Proposed Development remaining following the implementation of available mitigation measures are known as ‘residual effects’. These will be discussed for each of the potential effects, and their significance level identified.

4.5 Scoping and Consultation

4.5.1 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation measures to be incorporated into the project design thereby limiting adverse effects and enhancing environmental benefits.

4.5.2 Following the publication of this EIA Scoping Report, non-statutory consultation on the Proposed Development will be undertaken, using a range of methods available to the Applicant which may include newsletters, a telephone line, Twitter (X), a project website and virtual or physical exhibitions. The website will be maintained throughout the construction and operational phases of the Proposed Development to provide up-to-date information.

4.5.3 As required by Section 47 of the 2008 Act, the Applicant will prepare a Statement of Community Consultation (SoCC). The SoCC will outline the methods and timescales for the statutory consultation with the local community. FCC will be fully consulted on the draft SoCC prior to publication.

4.5.4 The Preliminary Environmental Information Report (PEIR) will be provided for statutory consultation, which will take place later in 2024. As for the non-statutory consultation, a range of methods including newsletters and ongoing use of the project website will be considered.

4.5.5 All responses received during consultation will be carefully considered and taken into account in the development of the project, in accordance with Section 49 of the 2008 Act. Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report, as required by Section 37 of the 2008 Act. This Consultation Report will be submitted with the DCO Application to PINS and will be available for public review at that point.

4.5.6 The Consultation Report will demonstrate how the Applicant has complied with the consultation requirements of the 2008 Act and will be considered by PINS, both when determining whether to accept the Application, and then in examining the Application.

5. Planning Policy and Need

5.1 Overview

5.1.1 This chapter of the EIA Scoping Report provides an overview of the planning policies of relevance to the Proposed Development at national and local level.

5.1.2 Development consent (granted in the form of a DCO) is required for the Proposed Development as it falls within the definition and thresholds of a NSIP under Section 14(a) 'the construction or extension of a generating station' and Section 15(1) and (3A) 'Generating stations' of the 2008 Act being a generating station in Wales that does not generate electricity from wind with a capacity of more than 350 megawatts. It also includes 'associated development' under Section 115(1)(b) and (4A) of the 2008 Act.

5.1.3 Under the 2008 Act regime, the policy framework for examining and determining applications for development consent is provided by National Policy Statements (NPSs). Section 5 of the 2008 Act allows the relevant SoS to designate NPSs setting out national policy in relation to the types of NSIPs listed at Section 14 of the 2008 Act. The NPSs are the primary policy used by the relevant SoS to examine and determine applications for development consent for NSIPs.

5.1.4 Section 104 of the 2008 Act provides that where a NPS has effect, the SoS must determine the application in accordance with the relevant NPSs and appropriate marine policy documents (if any) having regard to any local impact report produced by the relevant local planning authority; any matters prescribed in relation to development of the description to which the application relates; and any other matters which the SoS thinks are both "important and relevant" to their decision, unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty that applies to the SoS;
- be unlawful;
- result in the adverse impacts of the development outweighing the benefits; or
- be contrary to any condition prescribing how decisions regarding an NSIP application are to be taken.

5.1.5 Any other matters that the SoS may consider important and relevant to the Proposed Development could include matters such as government energy and climate change policy, national planning policy and local planning policy.

5.1.6 The following planning and energy policy is considered to be of relevance to the Proposed Development and is considered further below:

- the National Policy Statements (NPSs) for Energy;
- relevant Marine Policy Statements and Plans;
- relevant Government Energy and Climate Change Policy;
- National Planning Policy; and

- Local Planning Policy.

5.1.7 The application for development consent for the Proposed Development will include a Planning Statement that will set out in detail the policies and guidance of relevance to the Proposed Development and include an assessment of the Proposed Development against those policies and guidance.

5.2 National Policy Statements for Energy

5.2.1 Following previous review and consultation, revised NPSs for energy infrastructure were published by the UK Government on 22 November 2023 and came into force (were designated) on 17 January 2024. The revised NPSs are therefore relevant policy for applications for development consent submitted and accepted for examination following their designation.

5.2.2 The following revised energy NPSs are considered to be of relevance to the Proposed Development:

- the Overarching NPS for Energy (EN-1)[21];
- the NPS for Natural Gas Electricity Generating Infrastructure (EN-2)[22];
- the NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)[23]; and
- the NPS for Electricity Networks Infrastructure (EN-5)[24].

5.2.3 Section 2.2 of revised EN-1 confirms the Government's legally binding target of achieving net zero in terms of greenhouse gas emissions by 2050.

5.2.4 Section 2.3 'Meeting net zero' underlines how the provision of new energy infrastructure will be critical to the UK achieving net zero by 2050, while maintaining adequate, secure and reliable energy supplies and supporting economic growth. Paragraph 2.3.4 goes onto state:

"Meeting these objectives necessitates a significant amount of energy infrastructure, both large and small-scale. This includes the infrastructure needed to convert primary sources of energy (e.g. wind) into energy carriers (e.g. electricity or hydrogen), and to store and transport them into and around the country. It also includes the infrastructure needed to capture, transport and store carbon dioxide. The requirement for new energy infrastructure will present opportunities for the UK and contributes towards our ambition to support jobs in the UK's clean energy industry and local supply chains."

5.2.5 Paragraph 2.3.6 of EN-1 underlines the need to transform the energy system by:

[21] DESNZ, 2023; *Overarching National Policy Statement for Energy (EN-1)* [online]. Available at: https://assets.publishing.service.gov.uk/media/65a7864e96a5ec0013731a93/overarching-nps-for-energy-en1.pdf (Accessed 14/12/2023).
[22] DESNZ, 2023; *National Policy Statement for Natural Gas Electricity Generating Infrastructure (EN-2)* [online]. Available at: Available at: https://assets.publishing.service.gov.uk/media/655dc15a544aea000dfb3239/nps-natural-gas-electricity-generating-infrastructure-en2.pdf (Accessed 14/12/2023).
[23] DESNZ, 2023; *National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)* [online]. Available at: https://assets.publishing.service.gov.uk/media/655dc2d4046ed4000d8b9dd9/nps-natural-gas-supply-infrastructure-pipelines-en4.pdf (Accessed 14/12/2023).
[24] DESNZ, 2023; *National Policy Statement for Electricity Networks Infrastructure (EN-5)* [online]. Available at: https://assets.publishing.service.gov.uk/media/655dc25e046ed400148b9dca/nps-electricity-networks-infrastructure-en5.pdf (Accessed 14/12/2023).

"… tackling emissions while continuing to ensure secure and reliable supply, and affordable bills for households and businesses. This includes increasing our supply of clean energy from renewables, nuclear and hydrogen manufactured using low carbon processes (low carbon hydrogen), and, where we still emit carbon, developing the industry and infrastructure to capture, transport and store it."

5.2.6 EN-1 therefore underlines the importance of technologies such as carbon capture and storage (CCS) in decarbonising power generation and industry in order to achieve net zero by 2050. Furthermore, Section 2.4 of EN-1 sets out how the Government is developing business models and commercial frameworks to incentivise and support developers to finance the construction and operation of power stations with carbon capture.

5.2.7 Section 2.6 'Sustainable development' confirms (paragraph 2.6.1) that the Government's wider objectives for energy infrastructure include contributing to sustainable development and ensuring that our energy infrastructure is safe. Paragraph 2.6.2 is clear that sustainable development is relevant not just in terms of addressing climate change, but because the way energy infrastructure is deployed affects the well-being of the environment, society and the economy, for both current and future generations. For example, the availability of appropriate infrastructure supports the efficient working of the market so as to ensure competitive prices for consumers. The regulatory framework also encourages the energy industry to protect the more vulnerable.

5.2.8 Part 3 of EN-1 covers 'The need for new nationally significant energy infrastructure projects'. It sets out why the Government sees a need for significant amounts of new large-scale energy infrastructure to meet its energy objectives and why it considers that the need for such infrastructure will often be urgent (paragraphs 3.1.1 and 3.1.2). However, it notes at paragraph 3.1.2 that it will not be possible to develop the necessary amounts of such infrastructure without some significant residual adverse impacts. It goes onto state that these impacts will be minimised by the application of policy set out in Parts 4 'Assessment Principles' and 5 'Generic Impacts' of the NPS.

5.2.9 Section 3.2 provides guidance on SoS decision-making. Paragraph 3.2.1 confirms that the Government's objectives for the energy system are to ensure that supplies of energy always remain secure, reliable, affordable and consistent with net zero emissions by 2050. Paragraph 3.2.2 continues by stating that the UK needs a range of different types of energy infrastructure, while paragraph 3.2.3 states that it is for industry to propose new infrastructure within the strategic framework set by the Government. It also states that it is not appropriate for planning policy to set limits on different technologies. Furthermore, paragraphs 3.2.6 to 3.2.8 state that the SoS should assess all applications for development consent for the types of infrastructure covered by EN-1 on the basis that the Government has demonstrated that there is a need for those types of infrastructure which is urgent; that substantial weight should be given to that need; and that the SoS is not required to consider separately the specific contribution of any individual project to satisfying that need.

5.2.10 In considering 'The need for new electricity generating capacity', draft EN-1 confirms that there is an urgent need for new electricity generating capacity

(paragraph 3.3.20). The role of gas-fired plants with CCS in meeting this need is acknowledged at paragraph 3.3.44:

"Closed Cycle Gas Turbines (CCGTs) using natural gas can be equipped with CCS which is intended to reduce emissions compared to unabated gas-fired plants by 90 per cent or more."

5.2.11 Paragraphs 3.3.44 to 3.3.48 refer specifically to natural gas-fired plants. Paragraph 3.3.44 notes that CCGTs using natural gas can be equipped with CCS to reduce emission by 90 per cent or more and provide flexible generation that is able to ramp up or down to meet demand.

5.2.12 Section 3.4 sets out the need for new nationally significant gas infrastructure and at paragraphs 3.4.10 to 3.4.11 underlines its role in delivering affordable decarbonisation. Paragraph 3.4.11 states that this *"… means retaining the capability for using natural gas for low carbon dispatchable output in power stations equipped with CCS*."

5.2.13 Section 3.5 of EN-1 deals with 'The need for new nationally significant carbon capture and storage infrastructure'. Paragraph 3.5.1 notes that:

"There is an urgent need for new carbon capture and storage (CCS) infrastructure to support the transition to a net zero economy."

5.2.14 While paragraph 3.5.2 highlights the Committee on Climate Change's statement that CCS is a necessity and not an option and that:

"CCS infrastructure will also be needed to capture and store carbon dioxide from hydrogen production from natural gas …"

5.2.15 Paragraph 3.5.8 also confirms that "*to support the urgent need for new CCS infrastructure, CCS technologies, pipelines and storage infrastructure are considered to be CNP infrastructure.*"

5.2.16 Part 4 of revised EN-1 deals with the 'Assessment principles' that must be taken into account by applicants and the SoS in preparing and determining applications for nationally significant energy infrastructure. Paragraph 4.1.3 states that the SoS will start with a presumption in favour of granting development consent for applications for energy NSIPs given the level and urgency of need for such infrastructure. The assessment principles to be taken into account, as which are set out in Part 4, include matters such as environmental effects; health; marine considerations; environmental and biodiversity net gain; criteria for good design; climate change adaptation and resilience; pollution control; and safety and security considerations, amongst others.

5.2.17 One of the matters dealt with in Section 4.2 of Part 4 of EN-1, is the 'critical national priority' (CNP) for the provision of nationally significant low-carbon infrastructure. Paragraph 4.2.5 confirms that low-carbon infrastructure for the purposes of this policy include for electricity generation, natural gas fired generation which is CCR. The Proposed Development, which is for a carbon capture enabled gas-fired power station would therefore fall under this policy.

5.2.18 Paragraph 4.1.7 of EN-1 confirms that for projects which qualify as CNP Infrastructure, it is likely that the need case will outweigh the residual effects in all but the most exceptional cases. This presumption, however, does not apply to residual impacts which present an unacceptable risk to, or

interference with, human health and public safety, defence, irreplaceable habitats or unacceptable risk to the achievement of net zero.

5.2.19 Part 5 of EN-1 deals with 'Generic impacts'. Generic impacts are those impacts that arise from the development of all types of energy infrastructure covered by the energy NPSs. Generic impacts include matters such as air quality and emissions; flood risk; historic environment; landscape and visual; noise and vibration; socio-economic impacts; and traffic and transport, amongst others.

5.2.20 As confirmed above, the NPSs for Natural Gas Electricity Generating Infrastructure (EN-2), Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) are also of relevance to the Proposed Development. These NPSs do not repeat the policy set out in EN-1 but provide further policy on the assessment of and technology-specific information to be taken into account in the consideration of applications for the types of infrastructure covered by those NPSs.

5.3 Marine Policy

5.3.1 Section 104 of the 2008 Act requires the SoS to have regard to "*…the appropriate marine policy documents…"* relevant to the NSIP. The Proposed Development will involve some works within the UK Marine Area, that is, within the tidal River Dee.

5.3.2 The appropriate marine policy documents are defined at Section 59 of 'The Marine and Coastal Access Act 2009'[25] (MCAA). These include any marine policy statement which is in effect and to the extent that a decision relates to a marine plan area, any marine plan which is in effect for that area (Section 59(3) and (5).

UK Marine Policy Statement (March 2011)[26]

5.3.3 The UK Marine Policy Statement ('MPS'), adopted in March 2011, provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of Section 44 of the MCAA and is intended to sit alongside terrestrial consenting regimes, including the 2008 Act regime. The MPS was subject to updates in September 2020 relating to how references to EU law should be interpreted from 1 January 2021 following the UK's withdrawal from the EU.

5.3.4 Chapter 2 of the MPS outlines the vision for the UK Marine Area, the high-level approach to marine planning and general principles for decision making covering economic, social and environmental considerations. It also covers detailed considerations relevant to developments such as marine ecology and biodiversity; air quality; noise; water quality and resources; seascape; historic environment; climate change adaptation and mitigation; and coastal change and flooding.

5.3.5 Chapter 3 sets out the policy objectives for key activities that take place in the marine environment. Section 3.3 deals specifically with 'Energy production and infrastructure development'. Paragraph 3.3.1 notes that a

[25] Marine and Coastal Access Act 2009 (c.23). London: HMSO.
[26] HM Government; 2011; *UK Marine Policy Statement (2011)*. London: HMSO.

secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK. Paragraph 3.3.4 sets out issues that decision maker should take into account when examining and determining applications for energy infrastructure. Those of relevance to the Proposed Development include:

- the national level of need for energy infrastructure, as set out in the Overarching NPS for Energy (EN-1);
- the positive wider environmental, societal and economic benefits of low-carbon electricity generation and CCS/ CCUS as key technologies for reducing carbon dioxide emissions; and
- the UK's programme to support the development and deployment of CCS/ CCUS and in particular the need for suitable locations that provide for the permanent storage of carbon dioxide.

5.3.6 Paragraph 3.3.6 recognises that in some parts of the UK power stations may be sited in coastal locations and will have an important contribution to play in the UK's energy mix. It notes that the construction, operation or decommissioning of power stations may have impacts on the local marine environment through the construction of plants and associated development. There may also be impacts from abstraction and discharge of cooling water during operation. It refers to more detail on the impacts and specific measures and actions to avoid or minimise adverse impacts, including those on marine ecology, being contained within the NPSs, including EN-2 in respect of fossil fuel generating stations.

5.3.7 Paragraphs 3.3.31 to 3.3.35 deal with CCS/CCUS. Paragraph 3.3.31 recognises that fossil fuels will remain an important source of electricity generation for the foreseeable future and that, to comply with the UK's legally binding carbon reduction commitments, virtually all fossil fuel generation will eventually need to be fitted with technology that captures carbon dioxide and permanently stores it deep underground. It goes on to state that this will generate considerable volumes of carbon dioxide and that the UK offshore area is thought to be one of the most promising hub locations in Europe for the permanent storage of carbon dioxide.

5.3.8 The significant climate change and economic benefits of CCS/CCUS to the UK are set out at paragraph 3.3.34. Removing carbon dioxide emission from electricity generation will considerably reduce the potential for further acidification of the marine environment, while CCS/CCUS is estimated to be worth up to £3 billion a year to the UK economy by 2030, sustaining up to 100,000 jobs.

Welsh National Marine Plan (November 2019)[27]

5.3.9 The Welsh National Marine Plan ('WNMP') is the first marine plan adopted under the MCAA for the Welsh inshore and offshore regions. It was adopted and published on 12 November 2019 and its preparation and approval complied with the statutory requirements set out in Schedule 6 to the MCAA.

[27] Welsh Government, 2019; *Welsh National Marine Plan* [Online]. Available at: https://www.gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document_0.pdf (Accessed 20/12/2023)

The WNMP Area covers the south-western half of the River Dee Estuary, adjacent to the Site.

5.3.10 Paragraphs 15 and 16 refer to NSIPs and state that such projects should seek to deliver lasting legacy benefits for the local community, the economy and the environment. One of a number of ways to achieve this is through contributing to the transition toward the achievement of low-carbon, sustainable economic development, minimising carbon emissions and increasing the resilience of people, places and the environment to the effects of climate change.

5.3.11 The WNMP contains a number of 'General Cross-Cutting Policies'. This includes 'GEN General Policy – Planning Policy'. GEN_01: Planning Policy confirms that there is a presumption in favour of the sustainable development of the plan area. 'ECON General Policy – Achieving a Sustainable Marine Economy', includes ECON_1 which support sustainable economic growth, including that which builds a more resilient economy and generates employment opportunities for coastal areas. Other cross-cutting policies are aimed at ensuring a strong, healthy and just society; living within environmental limits; promoting good governance; and using sound science responsibly.

5.3.12 The WNMP also includes a number of 'Sector Policies'. Sector Policy 'Energy – Low Carbon' applies to both the inshore and offshore regions of the plan area and has the objectives of contributing toward the decarbonisation of the economy, albeit primarily through the increased development of marine renewable energy, and there is no reference to carbon capture-enabled electricity generation. Nevertheless, paragraph 351 does state that application for new NSIP development above the 350 MW threshold will be examined using the criteria on national need, benefits and impacts set out in the relevant NPSs.

5.3.13 Sector Policy 'Energy – Oil and Gas' is of particular relevance to the Proposed Development as its covers CCS. Paragraph 371 deals specifically with carbon capture-enabled gas-fired electricity generation stating:

5.3.14 "*The Energy Generation in Wales 2017 report recognises that gas, as a flexible, reliable, responsive energy source with lower emissions than other fossil fuels, is expected to continue to play a gradually diminishing role in the energy mix. However, it is unlikely to be a long-term basis for the energy economy of Wales without measures to mitigate the environmental effects, such as carbon capture and storage (CCS). This Plan therefore recognises the need to identify and exploit opportunities for the wider use of CCS. Such opportunities are currently understood to be small because of the geology of Wales and, consequently, there are currently no known suitable depleted oil and gas reservoirs. Should a development opportunity arise during the term of this Plan, it is likely to be located to the north of Wales, associated with the potential use of the Liverpool Bay gas reservoirs*."

5.3.15 Policy O&G_02: Oil and gas (supporting) confirms that proposals that support the long-term development of CCS technology will be supported where they contribute to the objectives of the WNMP.

5.4 Other Matters that may be 'Important and Relevant'

5.4.1 In making decisions on applications for NSIPs, Section 104 of the 2008 Act states that the SoS must also have regard to any other matters that they consider to be both important and relevant to their decision. Paragraph 4.1.5 of the current version of EN-1 provides some clarification on the other matters that the SoS may consider both important and relevant, such as national planning policy and local plan documents.

5.4.2 It is considered that the following may be important and relevant to the SoS's decision-making on the Proposed Development, and are discussed in more detail below:

- Government Energy and Climate Change Policy;
- Future Wales: The National Plan 2040[28];
- Planning Policy Wales[29]; and
- The Flintshire Local Development Framework[30].

5.5 Government Energy and Climate Change Policy

Clean Growth Strategy[31]

5.5.1 The 'Clean Growth Strategy – Leading the way to a low carbon future' (2017, Department for Business, Energy & Industrial Strategy (BEIS)) ('the CGS') sets out the aims of the Government to deliver increased economic growth while reducing carbon emissions.

5.5.2 The Executive Summary (page 9) confirms that for the UK to achieve its fourth and fifth carbon budgets (2023 to 27 and 2028 to 2032) it will be necessary to drive a significant acceleration in the pace of decarbonisation.

5.5.3 Page 69 deals with CCUS in detail. It states:

"*There is a broad international consensus that carbon capture, usage and storage (CCUS) has a vital role in reducing emissions. This could be across a wide range of activities such as producing lower-emission power, decarbonising industry where fossil fuels are used and/or industrial processes as well as providing a decarbonised production method for hydrogen which can be used in heating and transport. This makes CCUS a potentially large economic opportunity for the UK. The International Energy Agency estimates there will be a global CCUS market with over £100 billion – even a modest share of this global market, UK GVA could increase between £5 billion and £9 billion per year by 2030*."

[28] Welsh Government. (2021). *Future Wales, The National Plan 2040* [Online] Available at: https://www.gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf (Accessed 20/12/2023)
[29] Welsh Government, 2021; *Planning Policy Wales: Edition 11* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf (Accessed 20/12/2023)
[30] FCC, 2023; *Flintshire Local Development Plan 2015 – 2030. Adopted Plan 24th January 2023.* [Online] Available at: https://flintshire.gov.uk/en/PDFFiles/Planning/Examination-Library-Documents/FINAL-LDP-Written-Statement-English.pdf (Accessed 20/12/2023)
[31] Department for Business, Energy & Industrial Strategy, 2018; *Clean Growth – The UK Carbon Capture Usage and Storage deployment pathway - An Action Plan* [online]. Available at: https://assets.publishing.service.gov.uk/media/5bfd760bed915d118adbb940/beis-ccus-action-plan.pdf (Accessed 20/12/2023).

5.5.4 Pages 93 to 101 of Chapter 4 cover 'Delivering Clean, Smart, Flexible Power'. The overriding objective is to deliver a reduction in emissions from the power sector. Page 96 states that in order to achieve this it will be necessary to continue to bring down the costs of low-carbon generation from renewables and nuclear and ensure that the UK can deploy CCUS at scale during the 2030s. Page 101 reiterates that Government's commitment to supporting CCUS innovation and deployment through the BEIS Energy Innovation Programme (now known as the Net Zero Innovation Portfolio).

The Ten Point Plan for a Green Industrial Revolution (November 2020)[32]

5.5.5 'The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating our path to net zero', was published on 18 November 2020 and is aimed at delivering a 'Green Industrial Revolution' in the UK. The plan has a foreword by the Prime Minister stating that the plan will aim to mobilise £12 billion of Government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs.

5.5.6 Point 8 of the plan is 'Investing in Carbon Capture, Usage and Storage' (pages 22 to 24) and identifies the ambition to capture 10 Mt of CO_2 a year by 2030 and the Government's commitment to invest up to £1 billion to support the establishment of CCUS in four industrial clusters. It highlights the function and necessity of CCUS in achieving a green economy, including decarbonising power generation.

The Energy White Paper (December 2020)[33]

5.5.7 The Energy White Paper 'Powering our Net Zero Future' ('EWP') (BEIS, 2020), was presented to Parliament in December 2020. At the core of the EWP is the commitment to tackle climate change and achieve net zero. The EWP seeks to put in place a strategy for the wider energy system that transforms energy, supports a green recovery and creates a fair deal for consumers (page 4).

5.5.8 Chapter 2 'Power' of the EWP sets out how it is proposed to decarbonise electricity to enable the transition away from fossil fuels and decarbonise the economy cost-effectively by 2050. While the EWP (page 43) states that a low-cost, net zero consistent system is likely to be composed predominantly of wind and solar, in order to ensure the system is reliable, it needs to be complemented by technologies which provide power, or reduce demand, when the wind is not blowing or the sun does not shine. This includes gas with CCS and short-term dispatchable generation providing peaking capacity, which can be flexed as required. This is further underlined at page 47:

5.5.9 "*In the power sector, gas-fired generation with CCUS can provide flexible, low-carbon capacity to complement high levels of renewables. These*

[32] HM Government, 2020; *The Ten Point Plan for a Green Industrial Revolution* [online]. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf (Accessed 20/12/2023).
[33] DESNZ, 2020. *The Energy White Paper: Powering our Net Zero Future* [online]. Available at: https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future (Accessed 20/12/2023)

characteristics mean that deployment of power CCUS projects will play a key role in the decarbonisation of the electricity system at low cost."

Net Zero Strategy: Build Back Greener (October 2021)[34]

5.5.10 The 'Net Zero Strategy: Build Back Greener' expands on key commitments in the Ten Point Plan, the EWP and sets out the next steps the Government proposes to take to cut emissions, seize green economic opportunities and leverage further private investment in net zero. The strategy sets an indicative delivery pathway for emission reductions to 2037 by sector. It is intended to put the UK on the path for Carbon Budget 6 and ultimately on course for net zero by 2050.

5.5.11 Regarding power, the strategy states that the UK will fully decarbonise its power system by 2035 subject to security of supply. It states that the power system will consist of abundant, cheap renewables, cutting edge new nuclear power stations, underpinned by flexibility including storage, gas with CCUS and hydrogen (page 19).

Powering Up Britain (March 2023)[35]

5.5.12 On 30 March 2023 the Government published three documents comprising 'Powering Up Britain,' the 'Energy Security Plan' and 'Net Zero Growth Plan' following the judicial review of the Net Zero Strategy. All three documents provide details of the Government's measures to increase domestic energy production, resilience in the energy supply and achieve net zero.

5.5.13 The Energy Security Plan signals continued support towards the CCUS industry most notably the announcement of eight Track-1 projects across the hydrogen, power, industry, and waste sectors which are progressing towards negotiations. It underlines the importance of delivering flexibility on the supply side through power CCUS amongst other technologies.

Future Wales: The National Plan 2040

5.5.14 Future Wales: The National Plan 2040 ('NP') is the first national development framework produced for Wales and was adopted on 24 February 2021.

5.5.15 The NP sets out the Welsh Government's priorities for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of our communities.

5.5.16 As the national development framework, the NP is the highest tier of the development plan for Wales and is focused on solutions to issues and challenges at a national scale. Its strategic nature means it does not allocate development to all parts of Wales, nor does it include policies on all land uses. It is a framework which will be built on by Strategic Development Plans at a regional level and Local Development Plans at local authority level. These plans will identify the location of new infrastructure and development.

[34] DESNZ, 2020. *Net Zero Strategy: Build Back Greener. UK Government* [online]. Available at: https://www.gov.uk/government/publications/net-zero-strategy#:~:text=This%20strategy%20builds%20on%20that,reduce%20emissions%20for%20each%20sector (Accessed 20/12/2023)
[35] DESNZ, 2023; *Powering Up Britain* [online]. Available at: publishing.service.gov.uk. (Accessed 20/12/2023)

Strategic and Local Development Plans are required to be in conformity with the NP and must be kept up to date to ensure they and the NP work together effectively.

5.5.17 The document does not contain any policies directly relevant to NSIPs but does contain high level planning policies expressing the Welsh Government's support for low-carbon technologies.

5.5.18 Policy 17 'Renewable and Low Carbon Energy and Associated Infrastructure', for instance, establishes that the Welsh Government strongly supports the principle of developing renewable and low-carbon energy from all technologies and at all scale to meet future energy needs.

Planning Policy Wales (October 2023)

5.5.19 Planning Policy Wales ('PPW') sets out the land use planning policies of the Welsh Government. The PPW should be read alongside the NP as part of the national planning policy framework for Wales.

5.5.20 The document is not expressly relevant to NSIPs but does contain a section on 'Renewable and Low Carbon Energy'.

5.5.21 Paragraph 5.9.1 of the document establishes some duties for local authorities in relation to the consideration of renewable and low carbon economy. It states that "*Local authorities should facilitate all forms of renewable and low carbon energy development and should seek cross-department co-operation to achieve this. In doing so, planning authorities should seek to ensure their area's full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved*."

The Flintshire Local Development Framework (2023)

5.5.22 The Site lies entirely within the administrative area of FCC. The statutory development plan for the area currently comprises the Flintshire Local Development Plan ('LDP'), which was adopted in January 2023 and covers the period of 2015 to 2030.

5.5.23 A check has been undertaken of the Flintshire LDP proposals map and it can be confirmed that there are no local planning designations or allocations which cover the Site.

5.5.24 The following policies are considered to potentially be relevant to the Proposed Development:

- Policy STR1 Strategic Growth
- Policy STR2: The location of Development
- Policy STR4: Principles of Sustainable Development, Design, and Placemaking
- Policy STR5: Transport and Accessibility
- Policy STR6: Services, Facilities and Infrastructure
- Policy STR7: Economic Development, Enterprise and Employment
- Policy STR8: Employment Land Provision

- Policy STR13: Natural and Built Environment, Green Networks and Infrastructure
- Policy STR14: Climate Change and Environmental Protection
- Policy STR15: Waste Management
- Policy PC2: General Requirements for Development
- Policy PC3: Design
- Policy PC4: Sustainability and Resilience of New Development
- Policy PC5: Transport and Accessibility
- Policy EN2: Green Infrastructure
- Policy EN4: Landscape Character
- Policy EN6: Sites of Biodiversity Importance
- Policy EN7: Development Affecting Trees, Woodland and Hedgerows
- Policy EN8: Built Historic Environment and Listed Buildings
- Policy EN11: Green Wedges
- Policy EN12: New Development and Renewable and Low Carbon Energy Technology
- Policy EN13: Renewable and Low Carbon Energy Development
- Policy EN14: Flood Risk
- Policy EN15: Water Resources
- Policy EN16: Development on or near Landfill Sites or Derelict and Contaminated Land
- Policy EN18: Pollution and Nuisance
- Policy EN19: Managing Waste Sustainably

5.5.25 The above policies will be considered within the Planning Statement that will form part of the application for development consent for the Proposed Development.

6. Air Quality

6.1 Introduction

6.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on air quality. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

6.1.2 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report, as well as **Chapter 8: Traffic and Transport** for more information on the planned changes in traffic and **Chapter 9: Terrestrial and Aquatic Ecology** for the relevant ecological sites that will be considered in the assessment.

6.2 Legislation, Policy and Guidance

6.2.1 A number of national, regional and local legislation, policy and guidance documents related to air quality will be applicable to the Proposed Development, as summarised below:

Legislation

International Convention

- The Ramsar Convention[36].

Retained EU Directives

- The Air Quality Directive 2008[37];
- The Industrial Emissions Directive (IED) 2010[38];
- The European Birds Directive 2009[39]; and
- The Habitats Directive[40].

National Legislation

- The Air Quality Standards Regulations 2010[41];
- The Air Quality Standards (Amendment) Regulations 2016[42];
- Environment Act 1995;

[36] Ramsar, 1971; The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat. UNESCO.
[37] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. *Official Journal* L152:1. Luxembourg: The Publications Office of the European Union.
[38] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (recast). *Official Journal* L334:17. Luxembourg: The Publications Office of the European Union
[39] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds. *Official Journal* L20:7. Luxembourg: The Publications Office of the European Union
[40] Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora. *Official Journal* L206:7. Luxembourg: The Publications Office of the European Union
[41] *The Air Quality Standards Regulations 2010* (SI 2010/1001). London: HMSO.
[42] *Air Quality Standards (Amendment) Regulations 2016* (SI 2016/1184). London: HMSO.

- Environment Act 2021[43] (Part IV);
- The Environmental Permitting (England and Wales) Regulations (the EPR) (as amended) (2016)[44];
- Environmental Protection Act 1990 (Part III)[45]; and
- The Conservation of Habitats and Species Regulations 2017 (as amended)[46] (the Habitats Regulations).

Devolved Legislation

- Well-being of Future Generations (Wales) Act 2015[47];
- The Environment (Air Quality and Soundscapes) (Wales) Bill[48] (note: at the time of writing, the $PM_{2.5}$ target has not been set);
- The Air Quality (Wales) Regulations 2000[49]; and
- The Air Quality (Wales) (Amendment) Regulations 2002[50].

Planning Policy

National Planning Policy

- The Overarching NPS for Energy (EN-1) (Paragraphs 4.11.2, 4.11.9-4.11.10);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2) (does not introduce any additional requirements for air quality assessments relative to EN-1/ EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (does not introduce any additional requirements for air quality assessments relative to EN-1/ EN-2);
- The NPS for Electricity Networks Infrastructure (EN-5); does not include any policies specific to emissions to air); and
- PPW.

Local Planning Policy

6.2.2 FCC LDP (Policies STR14, PC2 and EN18).

Guidance

- The Clean Air Plan for Wales[51];
  - The human health objectives that are applicable to this assessment are set out in Table 8-1;

[43] *Environment Act 2021* (c. 30). London: HMSO.
[44] *The Environmental Permitting (England and Wales) Regulations 2016* (as amended) (SI 2016/1154). London: HMSO.
[45] *Environmental Protection Act 1990* (c. 43). London: HMSO.
[46] *The Conservation of Habitats and Species Regulations 2017* (SI 2017/1012). London: HMSO.
[47] *Well-being of Future Generations (Wales) Act 2015* (anaw 2). London: HMSO.
[48] *The Environment (Air Quality and Soundscapes) (Wales) Bill* 2023. Cardiff: Senedd.
[49] *The Air Quality (Wales) Regulations 2000* (SI 2000/1940) (W. 138). London: HMSO.
[50] *The Air Quality (Wales) (Amendment) Regulations 2002* (SI 3182) (W. 298). London: HMSO.
[51] Welsh Government, 2020; *The Clean Air Plan for Wales* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf (Accessed 20/12/2023).

- BAT Reference Document (BRef) for Large Combustion Plants (LCP BAT Conclusions) [52] (specifies the BAT-Associated Emission Levels (BAT-AELs));
- Air Quality Modelling and Assessment Unit (AQMAU) recommendations for the regulation of impacts to air quality from amine-based post-combustion carbon capture plant. AQMAU-C2025-RP01;
- AQMAU Proposed assessment method to include amines and degradation products in nutrient nitrogen deposition estimations at ecological sites AQMAU-C2600-RP01 (draft);
- BAT Review for New Build and Retrofit Post-Combustion Carbon Dioxide Capture Using Amine-Based Technologies for Power and CHP Plants Fuelled by Gas and Biomass as an Emerging Technology under the IED for the UK[53];
- Post-combustion CO_2 capture: BAT[54];
- DMRB Sustainability & Environment Appraisal – LA 105 Air Quality[55]; and
- Air Emissions Risk Assessment for your Environmental Permit Guidance ('EPR Risk Assessment Guidance')[56].

6.2.3 The (NRW) EPR Risk Assessment Guidance is applied in relation to Environmental Permit applications in Wales. Though the EPR Risk Assessment Guidance relates to specifically to permitting, it provides useful supplementary information for interpreting the significance of air quality impacts.

6.2.4 The Institute of Air Quality Management (IAQM) is a professional body that produces guidance on the assessment of air quality impacts. IAQM guidance will be used in this assessment where statutory guidance is not available:

- Land-Use Planning & Development Control: Planning for Air Quality[57] ('IAQM/EPUK Guidance');
- IAQM: A guide to the assessment of air quality impacts on designated nature conservation sites ('IAQM Nature Site Guidance')[58]; and
- Guidance on the assessment of dust from demolition and construction[59] ('IAQM Construction Dust Guidance').

[52] Joint Research Centre, 2017; *Best available techniques (BAT) conclusions for large combustion plants*. Luxembourg: The Publications Office of the European Union
[53] UK CCS Research Centre, 2021; *AQMAU recommendations for the regulation of impacts to air quality from amine-based post-combustion carbon capture plant. AQMAU-C2025-RP01* [online]. Available at: https://ukccsrc.ac.uk/wp-content/uploads/2021/11/AQMAU-C2025-RP01.pdf
[54] Environment Agency, 2021; *Post-combustion Carbon Dioxide Capture: Best Available Techniques (BAT)* [online]. Available at: https://www.gov.uk/guidance/post-combustion-carbon-dioxide-capture-best-available-techniques-bat
[55] National Highways (Welsh Government), 2019; *Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal- LA 105 Air Quality*. Cardiff: Welsh Government.
[56] Environment Agency and Department for Environment, Food & Rural Affairs (Defra), 2016; *Air emissions risk assessment for your environmental permit guidance* [online]. Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit (Accessed 30/01/2024).
[57] IAQM, 2017; *Land-Use Planning & Development Control: Planning For Air Quality*. London: IAQM.
[58] IAQM, 2020; *A guide to the assessment of air quality impacts on designated nature conservation sites*. London: IAQM
[59] IAQM, 2024; *Guidance on the assessment of dust from demolition and construction*. London: IAQM.

6.3 Assumptions, Limitations and Uncertainties

6.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development. To complete a conservative assessment of potential effects, a assumptions used will include: a peak construction traffic emission scenario based on peak construction flows under a full year of meteorological conditions for a past calendar year, in relation to long-term and short-term effects.

6.3.2 Until the preferred technology provider is selected, there will be some degree of uncertainty in the operational emissions used in the assessment. In order to minimise the potential for under-estimating the predicted impacts for the operational emissions, a number of conservative assumptions will be made in the assessment, as follows:

- continuous operation (i.e. for 8,760 hours per year) of the CCGT and CCP for the Proposed Development when both Train 1 and Train 2 (or combined single phase) are developed (i.e. the Proposed Development is fully built out) will represent the reasonable worst-case. In practice, the plant would require routine maintenance periods;
- emissions to air at the maximum allowable limits from the BAT-AELs defined in the LCP Bref at all times, when in reality emissions should, on average, be below the limits;
- assessment of air quality impacts based on the point of maximum impact across the modelled grid in addition to impacts at identified receptors; and
- worst results from five years of representative meteorological data, used to remove the uncertainty linked to natural variation in meteorological conditions.

6.3.3 Any bypass stacks associated with Proposed Development's CCGT units would only be operational when the Proposed Development is operating in an unabated mode (i.e. combustion emissions only, with no carbon capture taking place); hence, bypass stack emissions would not be representative of the typical operating scenario. Whilst the bypass stacks would be considerably shorter (circa 56 m) than the CCP absorber stack(s) the higher emission temperatures are expected to result in lower air quality impacts relative to emissions from the CCP absorber stack(s). It is therefore assumed that the ES will report air quality impacts arising from emissions from the CCP (the Proposed Development operating in abated mode) using Rochdale Envelope principles. Sensitivity testing will be undertaken to confirm this assumption.

6.3.4 The main limitation will be that the assessment is based on the latest understanding of the CCGT and CCP plant design at the time of writing. There is also uncertainty associated with any modelling assessment, due to the inherent uncertainty of the dispersion modelling process itself. The latter uncertainty is addressed through the use of worst-case assumptions, as described above, so that the air quality assessment represents a conservative assessment process. The use of dispersion modelling is a widely applied and accepted approach for the prediction of impacts from industrial sources.

6.4 Baseline Conditions

Study Area

6.4.1 This section covers all aspects of the Site. As the aspects of the Site (**Figure 1-3** (**Appendix A**)) are geographically close, from an air quality perspective, no distinction has been made between each aspect. The study areas set out below align with criteria set out in the IAQM guidance in Section 6.2.3. and the relevant aspects of Environment Agency guidance identified therein.

6.4.2 To identify the relevant baseline for future operational assessment, a study area of 15 km from the Main Site (where operational emissions will arise) has been identified for statutory designated ecological sites i.e. SPAs, SACs, Ramsar sites (protected wetlands)) and SSSIs and of 2 km for non-statutory designated nature conservation sites (ancient woodlands[60], local wildlife sites (LWS) and national and local nature reserves (LNR)).

6.4.3 Impacts on human health receptors are likely to be negligible beyond 2 km of the stack(s) although the exact study area for operational air quality in relation to human health receptors will be determined following the initial dispersion modelling and reported in the PEIR.

6.4.4 For the construction/ decommissioning dust risk assessments, the study area is set as 250 m from the Site Boundary and 50 m from access roads up to 250 m from the Site entrance for potential impacts to human health and amenity; and 50 m from the Site Boundary and 50 m from access roads up to 250 m from the Site entrance for potential impacts on relevant ecological sites.

6.4.5 For potential impacts due to changes in pollutant concentrations associated with changes in road traffic flows, the study area for potential impacts on sensitive receptors will be 200 m from the road centreline of all road links in the affected road network.

6.4.6 Meteorological data to support air quality modelling will be sourced from the Met Office site at Hawarden Airport, located approximately 7 km south-east of the Proposed Development.

Baseline

6.4.7 As stated in the North Wales Authorities Collaborative Project 2022 Air Quality Progress Report[61], there are no Air Quality Management Areas (AQMAs) designated within the administrative boundary of FCC or the adjoining Welsh local authority areas of Denbighshire and Wrexham, as well as in the Wirral. The nearest AQMAs are located within Cheshire West and Chester Council, one in Chester approximately 12 km east from the Site and two in Ellesmere, approximately 13 km and 15 km north-east from the Site. As the two in Ellesmere are designated in relation to the 15-minute sulphur dioxide air quality standard, they are not considered relevant to the assessment of impacts from the Proposed Development.

[60] Ancient woodland can form part of statutory designated nature conservation sites (e.g. Sites of Special Scientific Interest)
[61] The North Wales Authorities, 2022; *North Wales Authorities Collaborative Project 2022 Air Quality Progress Report* [online]. Available at: https://www.conwy.gov.uk/en/Resident/Environmental-problems/assets-Air-Quality/documents/North-Wales-Authorities-Collaborative-Project-2022-Air-Quality-Progress-Report-v2-Final-Issue00001-C02.pdf (Accessed 20/12/2023).

6.4.8 FCC conducts local air quality measurements for nitrogen dioxide (NO_2) at 59 sites (in 2021), according to the local air quality progress report. At all locations where air quality measurement is conducted, all concentrations are well below the relevant objectives. Annual mean NO_2 concentrations at the closest urban background diffusion tube to Site vary between 12.6 µg/m^3 and 10.1 µg/m^3 in the past five years (excluding 2020, as monitoring during that year was affected by the Covid-19 pandemic).

6.4.9 DEFRA's background maps[62] predict annual mean concentrations of 6.8 µg/m^3 for NO_2, 9.4 µg/m3 for PM_{10} and 6.2 µg/m^3 for $PM_{2.5}$ in 2023.

6.4.10 The baseline data will be used in the air quality assessment of both human health and ecological receptors within the study area.

6.4.11 Sensitive ecological sites within the air quality study area will be determined with reference to **Chapter 9: Terrestrial and Aquatic Ecology** but statutory designated sites are considered to include:

- the Dee Estuary (Ramsar, SAC, SPA and SSSI);
- the River Dee and Bala Lake (SAC, SSSI);
- Deeside and Buckley Newt sites (SAC);
- Alyn Valley Woods and Alyn Gorge Caves (SSSI, SAC);
- Halkyn Mountain (SAC);
- the Mersey Estuary (Ramsar, SPA, SSSI);
- Connah's Quay Ponds and Woodland (SSSI);
- Buckley Claypits and Commons (SSSI);
- Maes y Grug (SSSI);
- Coed Talon Marsh (SSSI);
- Tyddyn-y-barcut (SSSI);
- Halkyn Common and Holywell Grasslands (SSSI);
- Flint Mountain (SSSI);
- Herward Smithy (SSSI);
- Inner Marsh Farm (SSSI);
- Parc Linden, Lixwm (SSSI);
- Shotton Lagoons and Reedbeds (SSSI); and
- Hallwood Farm Marl Pit (SSSI).

6.4.12 Baseline conditions at other non-statutory designated sites (e.g. LWS/ ancient woodland) that are considered potentially sensitive to ammonia (NH_3) and nitrogen deposition during operation will also be identified.

6.4.13 Human health receptors will be determined with reference to **Chapter 18: Human Health** and include representative locations in Connah's Quay, Flint, Flint Mountain and other isolated properties close to the Site. Detailed

[62] DEFRA, 2020; *Background Mapping data for local authorities – 2018* [online]. Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018 (Accessed 20/12/2023).

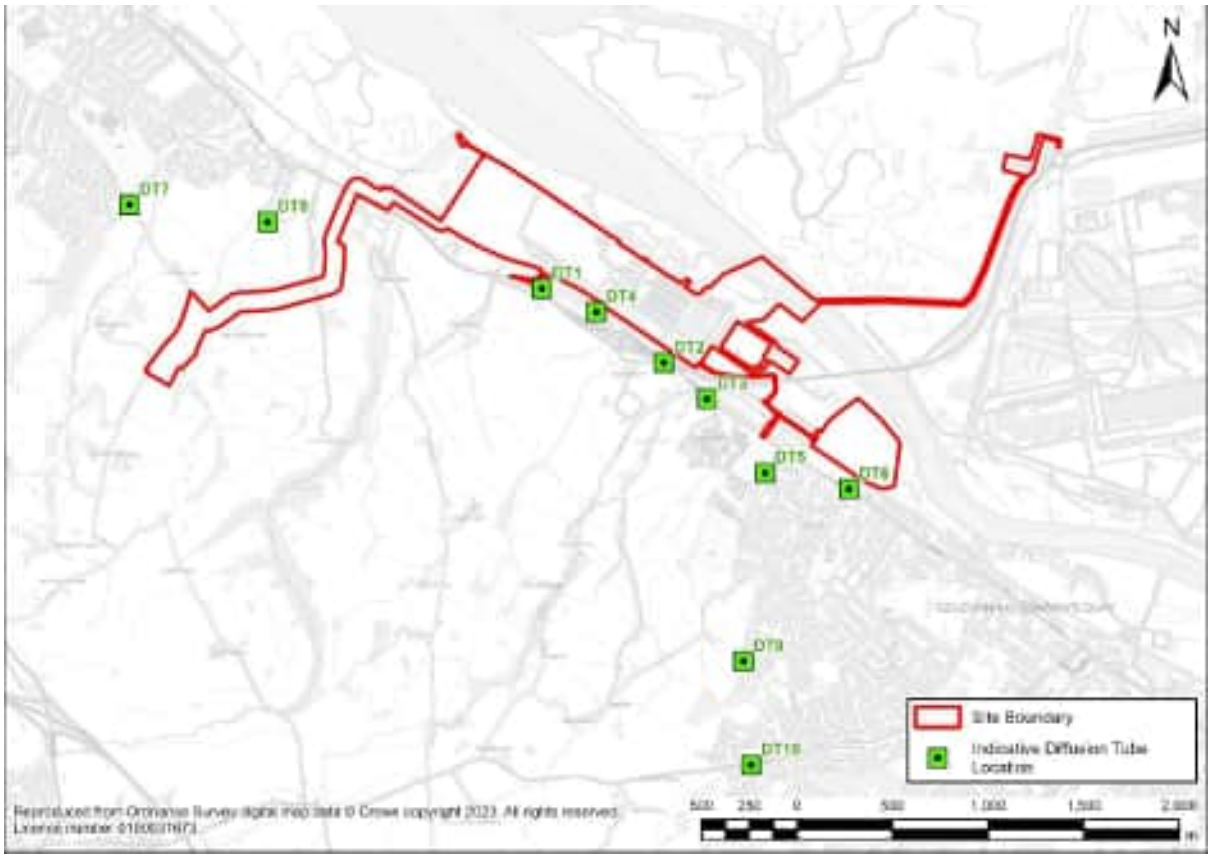
locations within the study area will be determined through a review or mapping and aerial photography, and included within the assessment where appropriate. A list of human health receptors to be included in the assessment will be reported in the PEIR.

Surveys

6.4.14 In addition to carrying out a desk-based study of baseline air quality, the Applicant proposes to undertake a three-month project-specific diffusion tube measurement survey for baseline NO_2 to establish existing concentrations within the study area including adjacent to the road network surrounding the Site. Indicative locations are presented in **Plate 6-1**.

6.4.15 Following completion of the survey, the results will be annualised to correct for seasonal variation and to make data representative of the whole year.

Plate 6-1 Indicative Diffusion Tube Locations



6.4.16 In relation to ecosystems, for oxides of nitrogen (NO_x) and NH_3 background concentrations for designated sites will be sourced from the UK Air Pollution Information System (APIS) website[63]. Any additional monitoring considered necessary to provide baseline information (e.g. at non-statutory designated ecological receptors) will be agreed with stakeholders including NRW and FCC, and described in the ES.

Sources of Information

6.4.17 The following sources of information have been reviewed:

[63] APIS, 2023; *Air Pollution Information System* [online]. Available at: https://www.apis.ac.uk/.

- data on emissions to atmosphere from the process supplied by the design contractor, and/or taken from BAT-AELs;
- **Figure 1-3 Indicative DCO Site Layout (Appendix A)**;
- Ordnance Survey (OS) mapping[64];
- baseline air quality data from project specific monitoring, published sources (Defra background maps and APIS) and Local Authorities' Air Quality Progress Reports; and
- meteorological data supplied by ADM Ltd[65].

6.5 Impact Assessment Methodology

6.5.1 The primary air quality issues to be assessed in connection with the Proposed Development will be:

- determination of the existing and future baseline;
- fugitive emissions of dust and particulate matter during the construction / decommissioning phases;
- traffic emissions during the construction / decommissioning and operational phases;
- prediction of the impacts and effects of operational emissions to air on human health and ecological receptors; and
- consideration of cumulative impacts from other committed developments.

Future Baseline

6.5.2 The Applicant's existing CCGT units at Connah's Quay Power Station will be on-site and operating during construction and potentially operating during periods coinciding with the operation of the Proposed Development. The existing Connah's Quay Power Station will therefore form part of the future baseline for the construction phase (which could commence in 2026 and last up to four years for Train 1 or combined single phase for Train 1 and Train 2) and potentially during the operational phase of the Proposed Development. Further information on the assumptions will be provided in the PEIR.

Approach

6.5.3 Construction/ decommissioning phase dust impacts, and the level of recommended mitigation, will be qualitatively assessed based on the framework approach suggested in the IAQM Construction Dust Guidance, so as to avoid significant adverse effects on amenity or the potential for a statutory nuisance. The aim of such an assessment is to identify the recommended level of mitigation required for the construction activities (including in design and management of the Site) such that residual impacts are considered to be insignificant, using a risk-based approach. Such measures can then be incorporated into the Framework CEMP that accompanies the Application and thereafter controlled via requirement of the

[64] OS, 2023; *Ordnance Survey Maps* [Online] Available at: https://explore.osmaps.com/ (Accessed November 2023)
[65] AMD Ltd, 2023; *Data Purchase* [online]. Available at: https://www.aboutair.com/data-purchase/

draft DCO which will require a Final CEMP, in accordance with measures set out in the Framework CEMP.

6.5.4 During the construction/ decommissioning and operational phases of the Proposed Development, there is the potential for changes in traffic flows on the surrounding road network due to additional vehicles accessing the Site to give rise to air quality effects at nearby sensitive receptors. The construction phase assessment will be based on criteria set out in the IAQM/EPUK Guidance and DMRB LA105, on the requirement to undertake a detailed assessment of road traffic emissions. Where road traffic emissions cannot be screened out and further assessment is considered necessary, concentrations of NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) at sensitive receptors due to changes in traffic flows on the surrounding road network will be predicted using the ADMS Roads software package.

6.5.5 During the operational phase, there is potential that emissions from the Proposed Development itself could affect human health in residential areas in closest proximity to the Site. Emissions from road traffic could also affect human health at residential properties adjacent to traffic routes used by vehicles accessing the Site. Long-term impacts on ambient pollutant concentrations and the deposition of nutrient nitrogen and acid to ground could adversely affect sensitive ecosystems.

6.5.6 Modelling of maximum ground-level impacts at a range of release heights will be undertaken in order to evaluate the effect of increasing the effective release height on dispersion. This will be used to determine the appropriate stack height(s) taking into consideration the incremental reduction in air quality impacts relative to the incremental increase in height together with other effects such as increasing visual impact. As an initial indicator, the base-case will assume the parameters set out in **Chapter 3: The Proposed Development** i.e. that emissions from the absorber tower stack(s) could be released at circa 105 m indicative height AGL.

6.5.7 Assessment of operational phase impacts will consider the change in air quality resulting from the Proposed Development CCP stack(s), in particular for NO_X, NO_2 and carbon monoxide (CO) from any combustion activities carried out and amine and amine degradation products (nitrosamines and nitramine, referred to as ‘N-amines’, and ammonia) from post-combustion CCP technology. As described in section 6.3, emissions from the bypass stack(s) when the plant is operating in unabated mode (i.e. with no carbon capture taking place) are not expected to provide the worst-case scenario that requires reporting in the ES. However, this will be subject to sensitivity testing/ dispersion modelling to confirm this is the case. A plume visibility assessment will also be conducted to determine how often a visible release might occur from the stacks and how long the plume would be.

6.5.8 The dispersion model ADMS 6 will be used to model ground level concentrations associated with the proposed point source emissions, including determination of appropriate stack heights and sensitivity to input parameters. The ES will explain the assumptions that have been made in the air quality assessment regarding the number, placement, and diameter of the stack(s). In line with the Rochdale Envelope approach, as the final plant layout and design elements (including building heights and absorber tower and stack heights) will remain subject to change until detailed design,

modelling carried out will consider a range of stack locations within the Main Site (typically the stack(s) located in all four corners of a 'Work' area) with the worst-case results being reported.

6.5.9 Potential air quality impacts will be assessed at specified local receptor locations including residential properties and consideration will also be given to impacts at the highest impact location and the relevance of that location to air quality exposure.

6.5.10 Potential air quality impacts on human health will be assessed against (i) UK Air Quality Standards as set out in the Air Quality Standards Regulations and (ii) Environmental Assessment Levels set out in the regulatory EPR Risk Assessment Guidance.

6.5.11 Impacts on sensitive ecological sites will be assessed using (i) Critical levels set out in the Air Quality Standards Regulations 2010 and regulatory EPR Risk Assessment Guidance and (ii) Critical loads and critical levels taken from the Air Pollution Information System (APIS).

6.5.12 In addition to the impacts associated with the Proposed Development, the assessment would include consideration of existing background air quality in the locality and the potential contributions from other projects which are not yet in operation but have consent and could influence future local air quality.

6.5.13 AECOM has developed a screening model approach, in agreement with the Environment Agency, for assessment of emissions of amine degradation products from amine-based CCP that includes consideration of both direct process emissions and indirect emissions generated through atmospheric degradation of amine post-release. This model approach will be utilised for the assessment of N-amines, subject to consultation with NRW, to assist with the establishment of appropriate stack heights and embedded mitigation.

6.5.14 The Amines Chemistry module developed by Cambridge Environmental Research Consultants (CERC) for ADMS 6 will be used, with appropriate selection of parameters in consultation with the project engineers and technology vendors (where appropriate) to provide an assessment of N-amine impacts. These will be presented in the ES.

6.5.15 Whilst there are well established EALs for NO_2, CO and NH_3, the suite of EALs relating to amines and amine degradation products is much more limited. Currently the EPR Risk Assessment Guidance only includes EALs for monoethanolamine (MEA) and N-nitrosodimethylamine (NDMA). The UK regulators currently have a contract in place to establish a more robust suite of EALs, which should become available during preparation of the ES. In the event that EALs are not available for the specific amines and amine degradation species associated with the selected capture solvent technology (or in the event that the capture technology choice is not confirmed) a worst-case approach will be taken using EALs for amines and degradation products where reasonable justification can be provided that these are of equivalent or greater potential toxicity than the species associated with the CC technology under consideration for the Proposed Development.

6.5.16 An interdisciplinary approach to the assessment of air quality impacts on statutory and non-statutory designated ecological receptors will be undertaken in consultation with statutory consultees (NRW and FCC).

Results of modelling, including an assessment against critical levels and critical loads for nutrient nitrogen and acid deposition, using the dispersion model results will be reported in an Appendix of the ES Air Quality Chapter. However, the effects on relevant habitats and species will be reported in the ES Terrestrial and Aquatic Ecology and, where relevant, Marine Ecology ES chapters, with the findings used to inform the Habitats Regulations Assessment (HRA).

6.5.17 For potential amenity effects, such as those related to dust deposition, the aim is to bring forward a scheme, to include mitigation measures as necessary that minimises the potential for amenity, human health, and ecological impacts as a result of the Proposed Development construction works. The IAQM Construction Dust Guidance does not provide a method for the evaluation of impacts on receptors from construction dust, rather a means to determine the level of mitigation required to avoid significant effects on receptors. The guidance indicates that application of appropriate mitigation should ensure that residual effects will normally be 'not significant'. Such control measures are proposed to be included in the Framework CEMP that informs the final CEMP by the appointed contractor.

6.5.18 The evaluation of the significance of air quality effects from the traffic and operational point sources will be based on the criteria referenced in IAQM/EPUK Guidance, and in NRW's EPR Risk Assessment guidance. The predicted changes in pollutant concentrations are compared to Air Quality Assessment Levels (National Air Quality Strategy objective or Environmental Assessment Level) (AQAL) to determine the magnitude of change.

6.5.19 For a change of a given magnitude, the IAQM/EPUK Guidance has published recommendations for describing the magnitude of long-term impacts at individual receptors and describing the significance of such impacts. The terminology will be aligned where appropriate in order to maintain consistency with the rest of the ES – for example where the IAQM uses 'substantial' this could be changed to 'major', and 'slight' could be changed to 'minor'.

6.5.20 The IAQM Guidance provides effect descriptors based on individual impacts and total pollutant concentrations at individual receptors and then describes how the overall significance of the effects should be considered 'in the round' as being significant or not significant. In this assessment, an overall 'moderate' or 'major' adverse effect is likely to be significant and 'negligible' or 'minor' effects will be considered not significant. The use of NRW's EPR risk assessment screening criteria within the judgment of significance of effects adopted within this assessment is discussed below.

6.5.21 NRW's EPR risk assessment screening criteria for comparison of PC with AQAL states that an emission may be considered insignificant (or negligible) where:

- short term PC <=10% of the AQAL; and
- long term PC <=1% of the AQAL.

6.5.22 Where an emission cannot be screened out as insignificant, the second stage of screening considers the PC in the context of the existing background pollutant concentrations; the predicted environmental concentration (PEC) is considered acceptable where:

- short term PC <20% of the short-term AQAL minus twice the long-term background concentration; and
- long term PEC (PC + background concentration) <70% of the AQAL.

6.5.23 The IAQM Nature Site Guidance indicates that the NRW's threshold criterion of 10% of the short term AQAL is sufficiently small in magnitude to be regarded as having an 'insignificant' effect. The IAQM Nature Site Guidance deviates from NRW's guidance (discussed below) with respect to the background contribution; the IAQM Nature Site Guidance indicates that severity of peak short-term concentrations can be described without the need to reference background concentrations as the PC is used to measure impact, not the overall concentration at a receptor. The peak short-term PC from an elevated source is described as follows:

- short term PC <=10% of the AQAL represents an 'insignificant' (negligible) impact;
- PC 11-20% of the AQAL is small in magnitude representing a minor impact;
- PC 21-50% of the AQAL is medium in magnitude representing a moderate impact; and
- PC >51% of the AQAL is large in magnitude representing a 'substantial' (major) impact.

6.5.24 The NRW EPR Risk Assessment Guidance states the following significance criteria, applicable to both critical loads and critical levels:

- For SACs, SPAs, Ramsar sites and SSSIs, impacts may be considered insignificant where:
  - the short-term PC is less than 10% of the short-term environmental standard; and
  - the long-term PC is less than 1% of the long-term environmental standard.
- For local nature sites (ancient woods, local wildlife sites (LWS) and national and local nature reserves) impacts may be considered insignificant where:
  - the short-term PC is less than 100% of the short-term environmental standard; and
  - the long-term PC is less than 100% of the long-term environmental standard.

6.5.25 The IAQM Nature Site Guidance recommends the same assessment criteria as the NRW guidance in relation to impacts on SACs, SPAs and SSSIs. In relation to LWSs, the IAQM Nature Site Guidance recommends that such sites are screened using the same criteria as SACs, SPAs and SSSIs (i.e. 1% for long-term impacts and 10% for short-term impacts), but notes that the determination of significance of any effect may differ for local wildlife sites. The IAQM Nature Site Guidance will be used for initial screening of all sites. Where local wildlife sites do not screen out, the EPR Risk Assessment Guidance criteria will be considered, as long-established quantitative

determinants of significance, together with advice provided by the project ecologists, to reach a conclusion on significance.

6.6 Embedded Mitigation

6.6.1 Where specific embedded mitigation is required, measures that have been used to determine the conclusions of the assessment will be set out within the ES.

6.6.2 The management of construction phase emissions, including dust and particulates, and the application of suitable mitigation measures will be secured through best practice control measures for the construction industry within the final CEMP. A Framework CEMP will accompany the Application; this will provide a framework of measures and principles to be taken forward and developed further by the appointed contractor.

6.6.3 For the operational phase, the Applicant will consider the need to control NO_x levels to the BAT-AEL before entering the carbon capture system and may propose selective catalytic reduction (SCR) – an industry standard measure to control NO_x levels. Other embedded mitigation to reduce ammonia may also be considered subject to ongoing design studies.

6.6.4 Dispersion modelling will be undertaken to determine the optimum stack heights, with consideration given to minimisation of ground-level air quality impacts and the visual impacts of taller stacks.

6.7 Potential Effects

6.7.1 In summary, the potential effects on air quality from the operation and construction/ decommissioning phases of the Proposed Development could occur due to:

- fugitive emissions of dust and particulate matter during the construction and decommissioning phases;
- emissions from road traffic the construction and decommissioning phases; and
- point source emissions from the Proposed Development CCP/ CCGT during operation.

6.7.2 As described in Section 3.7 (**Chapter 3: The Proposed Development**), once operational, it is anticipated that up to an additional 132 vehicle movements (i.e. 66 vehicles in/ out) may need to access the Site per day. This increase in road traffic movements during the operational phase would be too small to have any likely significant effects on local air quality using recognised screening criteria, as stated in the Land-Use Planning & Development Control: Planning for Air Quality guidance. Table 6.2 of this guidance includes a list of “indicative criteria to proceed to an air quality assessment”, two of which are “a change of light duty vehicle (LDV) of more than 500 AADT” and “a change of heavy duty vehicle (HDV) of more than 100 AADT”.

6.7.3 Further, it is anticipated that an additional 600 vehicle movements (300 LGV/ cars in/ out) may need to access the Site per day during routine outages. However, it is expected that such periods would be for circa 60 days every

four years. When combined with routine operational traffic estimates above, this would equate to a worst-case of 230 AADT (vehicle movements per day) within the year of maintenance only and with both routine operational and maintenance staff accessing the Site. As neither criteria are met during years with or without maintenance, it is proposed to scope out the need to assess operational road traffic emissions.

6.8 Additional Mitigation

6.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided. It is noted that any mitigation measures included for the purpose of avoiding or minimising risk to a Habitats site cannot be considered during HRA screening and so pre- and post-mitigation scenarios may need to be reported.

6.9 Summary of Potential Likely Significant Effects

6.9.1 A summary of elements proposed to be scoped into or out of the air quality assessment is provided in **Table 6-1**.

Table 6-1 Summary of the potential likely significant effects proposed to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Air Quality			
Construction	Fugitive emissions of dust and particulate matter (human health and relevant ecological receptors within the screening distance) Construction traffic on affected road network (human health and relevant ecological receptors within the screening distance)		
Operation	Emissions to air from the Proposed Development (Main Site) (human health and relevant ecological receptors within the study area) Plume visibility assessment	Operational road traffic (human health and relevant ecological receptors within the screening distance)	The increase in operational traffic is less than recognised screening criteria and is therefore proposed to be scoped out.
Decommissioning	Fugitive emissions of dust and particulate matter (human health and relevant ecological receptors within the screening distance) Decommissioning traffic (human health and relevant ecological receptors within the screening distance)		

7. Noise and Vibration

7.1 Introduction

7.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on noise and vibration. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development. This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report.

7.1.2 The scope of this chapter considers noise and vibration effects on human receptors and excludes assessment of noise and vibration on ecological or heritage receptors. The potential disturbance of local ecological or heritage receptors from noise due to the Proposed Development will be considered in **Chapter 9: Terrestrial and Aquatic Ecology**, **Chapter 10: Marine Ecology** and **Chapter 15: Cultural Heritage**. This chapter is supported by **Figure 7-1** (**Appendix A**). This chapter should also be read in conjunction with **Chapter 16: Socio-Economics, Recreation and Tourism** and **Chapter 18: Human Health**.

7.1.3 This chapter is also supported by the following figures:

- **Figure 7-1:** Demolition and Construction Noise Study Area, Operational Noise Study Area, Sensitive Receptors and Baseline Sound Monitoring Locations.

7.2 Legislation, Policy and Guidance

Legislation

- COPA; and
- Environmental Protection Act 1990.

National Planning Policy

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- PPW; and
- The NP.

Local Planning Policy

- FCC LDP with reference to:

- Policy STR14: Climate Change and Environmental Protection, which ensures that new developments have regard to protection of the noise environment;
- Policy PC2: General Requirements for Development, which states that new developments should not result in significant adverse noise impacts;
- Policy PC3: Design, which states that new developments should protect living conditions from harmful noise effects; and
- Policy EN18: Pollution and Nuisance, which new noise generating developments would only be permitted if it would not affect acoustic amenity and not restrict development of surrounding land.

Standards and Guidance

- Planning Guidance (Wales), Technical Advice Note (TAN) 11, Noise[66];
- Noise and Soundscape Action Plan for Wales 2018-2023[67];
- Noise and vibration management: environmental permits[68];
- British Standard (BS) 7445-1:2003 - Description and Measurement of Environmental Noise[69];
- BS 5228-1:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites. Noise[70];
- BS 5228-2: 2009+A1:2014 – Code of practice for Noise and Vibration control on construction and open sites. Vibration[71];
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings[72];
- Calculation of Road Traffic Noise (CRTN)[73];
- BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound[74];
- ISO 9613-2 'Attenuation of sound during propagation outdoors'[75];
- IEMA Guidelines for environmental noise impact assessment[76] (the IEMA Guidelines (Noise));

[66] Welsh Government, 1997; *Planning Guidance (Wales) Technical Advice Note 11: Noise* [online]. Available at: https://www.gov.wales/technical-advice-note-tan-11-noise (Accessed 04/12/2023).
[67] Welsh Government, 2018; *Noise and Soundscape Action Plan for Wales 2018-2023* [online]. Available at: https://www.gov.wales/noise-and-soundscape-action-plan-2018-2023-0 (accessed 04/12/2023).
[68] Environment Agency, 2022; *Noise and vibration management: environmental permits* [online]. Available at: https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits/noise-and-vibration-management-environmental-permits#purpose-of-this-guidance (accessed 04/12/2023).
[69] British Standards Institute, 2003; *BS 7445 – Description and environment of environmental noise – Part 1: Guide to quantities and procedures*. London: British Standards Institute.
[70] British Standards Institute, 2014; *BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. London: British Standards Institute.
[71] British Standards Institute, 2014; *BS 5228-2:2009+A1:2014 – Code of practice for Noise and Vibration control on construction and open sites. Part 2: Vibration*. London: British Standards Institute.
[72] British Standards Institute, 2014; *BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings*. London: British Standards Institute.
[73] Department of Transport/Welsh Office, 1998; *Calculation of Road Traffic Noise*. London: HMSO.
[74] British Standards Institute, 2019; *BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound*. London: British Standards Institute.
[75] ISO, 1996; *ISO 9613 Acoustics – Attenuation of sound during propagation outdoors: Part 2: General method of calculation*. Geneva: ISO.
[76] IEMA, 2014; *Guidelines for Environmental Noise Impact Assessment Version 1.2*. March: IEMA.

- Acoustics and Noise Consultants (ANC) Guide to BS 4142:2016+A1:2019 Technical Note Version 1.0[77]; and
- Building Bulletin 93 (BB93) Acoustic Design of Schools: Performance Standards.[78]

7.3 Assumptions, Limitations and Uncertainties

7.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

7.3.2 Any measurement of existing ambient or background sound levels will be subject to a degree of uncertainty. Environmental sound levels vary between days, weeks, and throughout the year due to variations in source levels and conditions, meteorological effects on sound propagation and other factors. Hence, any measurement survey can only provide a sample of the ambient levels and a small degree of uncertainty will always remain in the values taken from such a measurement survey.

7.3.3 Reasonable efforts will be made to ensure that measurements are undertaken in such a way as to provide a representative sample of conditions, such as avoiding periods of adverse weather conditions, and school holiday periods (which are often considered to result in atypical sound levels). Consequently, the level of uncertainty in measurements will be reduced as far as reasonably practicable.

7.3.4 Construction works noise levels will be predicted following guidance from BS 5228-1, which provides a realistic estimate of sound propagation from construction plant. The predictions will use representative noise levels, sourced from industry standard guidance documents such as BS 5228-1, for typical items of plant that are used in such developments.

7.3.5 The propagation of vibration through the ground is dependent on how the vibration source interacts with the ground, ground conditions and how the receptor is connected to the ground. Consequently, there is a degree of uncertainty when undertaking vibration predictions. Where relevant, construction phase vibration will be calculated based on historic vibration data and calculation methods from BS 5228-2.

7.3.6 Predictions of operational plant and activities sound pressure levels will be undertaken following guidance from ISO 9613-2, which are based on an assumption of moderate downwind propagation, and hence could be considered as a worst-case calculation. However, the standard also indicates an estimated accuracy of ±3 dB(A) in predicted levels.

7.4 Baseline Conditions

7.4.1 For the purposes of providing an assessment of likely significant construction noise and vibration effects, the study area has been determined by receptors within 300 m of the Site Boundary. This is based on BS 5228-

[77] Acoustics & Noise Consultants, 2020; *BS 4142:2014+A1:2019 Technical Note, Version 1.0* [online]. Available at: https://www.association-of-noise-consultants.co.uk/wp-content/uploads/2020/07/ANC-BS-4142-Guide-March-2020.pdf
[78] Department for Education, 2015; *Building Bulletin 93 Acoustic Design of Schools: Performance Standards* [online]. Available at: https://assets.publishing.service.gov.uk/media/5a8170d3e5274a2e8ab54012/BB93_February_2015.pdf (accessed 04/12/2023).

1:2009+A1:2014 which states that at "*distances over 300 m noise predictions have to be treated with caution, especially where a soft ground correction factor has been applied, because of the increasing importance of meteorological effects*".

7.4.2 The 300 m study area has been used for project elements where there would potentially be construction work, which includes the following:

- Main Site;
- Water Connection Corridor;
- Electrical Connection Corridor;
- Proposed CO_2 Connection Corridor; and
- Indicative Enhancement Area.

7.4.3 The study area for operational noise is defined at a distance of 1 km. This distance is based on professional judgement and AECOM's previous experience of CCGT and CCP projects and seeks to ensure that all potential impacts are captured. The 1 km operational study area has been used for where the Proposed Development contains noise generating plant (e.g. the Main Site).

7.4.4 No study areas have been assigned to 'existing' project elements (i.e. the Existing Natural Gas Connection Corridor or the Repurposed CO_2 Connection Corridor) that are not expected to require any construction works (other than minor maintenance/upgrade works to be carried out from AGIs) and would not change the ambient noise environment when operational.

Existing Baseline

7.4.5 A review of aerial imagery indicates that the dominant sources of sound in the area are likely to be existing infrastructure at and near to the Connah's Quay Power Station (including National Grid), rail traffic and traffic on the local road network including the A548 and Chester Road.

7.4.6 Receptors presented in **Table 7-1** and illustrated in **Figure 7-1** (**Appendix A**) have been determined through a desktop study of aerial imagery. These receptors are specific locations that may be affected by construction and operational noise.

7.4.7 Receptors in the town of Connah's Quay will also be covered in the noise and vibration assessment; however, due to the scale and density of residential receptors, they have not been explicitly identified. However, educational buildings in Connah's Quay have been explicitly identified.

7.4.8 Receptors in **Table 7-1** have been identified where they will be accounted for in the construction noise assessment (within 300 m of a construction site) and whether they will be considered in the operational noise assessment (within 1 km of the Main Site). A finalised list of assessment receptors will be selected through the scoping process and consultation with Environmental Health Officers at FCC.

Table 7-1 Sensitive Receptor Locations

Receptor ID	Name	Receptor Type	Construction Assessment	Operational Assessment
R1	Waen Isa Farm	Residential	✓	
R2	Coed-Onn Farm	Residential	✓	
R3	Little Leadbrook Farm	Residential	✓	
R4	Leadbrook Hall Barn/ Islyn, Leadbrook	Residential		✓
R5	Leadbrook Drive Properties (south)	Residential		✓
R6	Leadbrook Drive Properties (north)	Residential		✓
R7	Ffordd Pedrog Properties	Residential		✓
R8	Llys Cadfan Properties	Residential		✓
R9	Ffordd Tudno/ Llys Collen Properties	Residential		✓
R10	377-387 Chester Road	Residential		✓
R11	Hyfield, Chester Road	Residential		✓
R12	397-417 Chester Road	Residential		✓
R13	Ladies Masonic Lodge, Chester Road	Residential		✓
R14	337-369 Chester Road	Residential		✓
R15	Burneshead/ Mossgiel/ 421 Chester Road	Residential	✓	✓
R16	Paper Mill Lane/ Old Paper Mill Lane Properties	Residential		✓
R17	Paper Mill Lane Properties (south)	Residential		✓
R18	Oakenholt Farm	Residential		✓
R19	Glantraeth Farm	Residential	✓	✓
R20	Rockliffe Lane Properties	Residential	✓	✓
R21	Kelsterton Road Properties (west)	Residential	✓	✓
R22	Wenlo/ The Sheiling, Kelsterton Road	Residential	✓	✓
R23	Cae Coch Cottages, Kelsterton Road	Residential	✓	✓
R24	Kelsterton Farm	Residential	✓	✓
R25	The Coach House/ Kelsterton Hall	Residential	✓	✓
R26	Perenna Court Properties	Residential	✓	✓
R27	Coleg Cambria	Educational		✓
R28	Kelsterton Lodge/ 85-105 Kelsterton Road	Residential	✓	✓
R29	66-102 Kelsterton Road	Residential	✓	✓
R30	36-64 Kelsterton Road	Residential	✓	✓
R31	2-34 Kelsterton Road	Residential	✓	✓
R32	Connah's Quay High School	Educational	✓	✓

Planned Surveys

7.4.9 To define ambient sound conditions at receptors affected by operational noise, baseline sound surveys will be carried out for a minimum of one week. At receptors that are only affected by construction noise, attended monitoring will be undertaken to define typical ambient sound conditions during core construction work periods.

7.4.10 Surveys will be carried out following the agreement of their scope and methodology in consultation with the Environmental Health Officers at FCC. Suitable locations for monitoring will be agreed and will take into consideration the safety of the operators, security of monitoring equipment and accessibility.

7.4.11 Outline sound monitoring locations are presented in **Figure 7-1** (**Appendix A**). Baseline noise data will be used to define representative ambient sound conditions at sensitive receptors as per **Table 7-2**.

Table 7-2 Monitoring Locations and Representative Sensitive Receptor Locations

Monitoring Location ST – Short-Term LT – Long Term	Representative of Receptors
ST1	R1
ST2	R2, R3
LT1	R26, R27, R28, R29, R30
LT2	R19, R20, R21, R22, R23, R24, R25
LT3	R17, R18
LT4	R6, R7, R8, R9
LT5	Connah’s Quay Properties
LT6	Connah’s Quay Properties
LT7	Connah’s Quay Properties, R32
LT8	R30, R31
LT9	R10, R11, R12, R13, R14, R15
LT10	Ecological receptors
LT11	R4, R5, R16

7.4.12 The monitoring procedures will follow guidance from BS 7445-1:2003 and BS 4142:2014+A1:2019.

7.4.13 All sound measurements will include L_{Aeq}, L_{A90}, L_{A10} and L_{AFmax} sound level indicators over 15-minute contiguous periods. The surveys will be planned to avoid periods of high wind (>5 m/s) and rainfall. Weather conditions will be checked beforehand to ensure appropriate conditions are met. A weather station will also be set up to record relevant weather parameters including wind speed, wind direction and precipitation during the survey period. Processing of raw data following completion of the survey will be undertaken

to provide representative data (i.e. excluding data collected during adverse weather conditions, where necessary).

Sources of Information

7.4.14 The following sources of information have been reviewed:

- **Figure 1-3 Indicative DCO Site Layout (Appendix A)**; and
- satellite imagery[79].

7.5 Impact Assessment Methodology

Construction Phase

7.5.1 Construction works noise levels will be predicted following guidance from BS 5228-1 which provides a realistic estimate of sound propagation from construction plant. The predictions will use representative noise levels, sourced from industry standard guidance documents such as BS 5228-1, for typical items of plant that are used in such developments as advised by the Applicant.

7.5.2 Noise and vibration levels associated with construction works will be assessed (at chosen sensitive receptors presented in **Table 7-1**, intended to be agreed with the Environmental Health Officers at FCC) using the data and procedures given in BS 5228-1. Reference will be made to the 'ABC' method set out in Annex E of BS 5228-1 when defining criteria for assessing the significance of construction noise effects. The ABC method is reproduced in **Table 7-3**.

Table 7-3 BS 5228-1 ABC Method

Assessment category and threshold value period	Threshold values in dB $L_{Aeq,T}$		
	Category A [A)]	Category B [B)]	Category C [C)]
Night-time (23:00-07:00)	45	50	55
Evening and weekends [D)]	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

NOTE 3 Applied to residential receptors only.

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

D) 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

[79] Google Earth (2023) 10.45.0.3. Available at: https://earth.google.com/web/search/connahs+quay/@53.23556309,-3.09575476,5.76756259a,5589.01960902d,35y,0h,0t,0r/data=CigiJgokCeNGIu46eDNAESh4q52bmhXAGSTgOl26DjVAIby98X7Gb0PA.

7.5.3 With consideration of the above, **Table 7-4** presents the construction noise magnitude of impact criteria for residential receptors.

Table 7-4 Construction Traffic Noise Magnitude Criteria

Significance of Effect	Construction Noise Level $L_{Aeq,T}$ (dB)
Major	Exceedance of ABC Threshold Value by ≥5 dB
Moderate	Exceedance of ABC Threshold Value by up to 5 dB
Minor	Equal to or below the ABC Threshold Value by up to 5 dB
Negligible	Below the ABC Threshold Value by ≥5 dB

7.5.4 Construction phase vibration will be assessed based on historic vibration measurement data and calculations methods set out in BS 5228-2. Calculations of the likely levels of piling vibration will be undertaken using regression analysis of historic piling data in BS 5228-2. Likely significant effects will be assessed with reference to Table B.1 of BS 5228-1, which is used as the basis for **Table 7-5**.

Table 7-5 BS 5228-2 Guidance on Vibration Effects

Significance of Effect	Vibration level	BS 5228-2 Description
Major	5.0 to 10.0 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Moderate	1.0 to 5.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
Minor	0.3 to 1.0 mm/s	Vibration might just be perceptible in residential environments.
Negligible	0.14 to 0.3 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.

7.5.5 The temporary changes in road traffic noise levels along the local road network due to construction traffic will be assessed based on short-term impact classification criteria from Table 7-14 of the IEMA Guidelines (Noise), which is used as the basis for **Table 7-6**.

Table 7-6 Short-term Demolition and Construction Traffic Assessment Criteria

Significance of Effect	Short-term noise change (dB $L_{A10,18h}$)
Major	≥ 5 dB
Moderate	≥ 3 dB and < 5 dB
Minor	≥ 1 dB and < 3 dB
Negligible	≥ 0 dB and < 1 dB

Operational Phase

7.5.6 The impact of the proposed operational plant will be assessed following guidance from BS 4142. The rating level of operational plant noise emissions

are compared against the background level of the pre-development noise climate.

7.5.7 BS 4142 advises that, where rating levels and background levels are low, which may be the case in rural areas surrounding the Site, the assessment of operational noise should take into context the absolute noise level. The ANC Guide to BS 4142 provides context to this by stating:

"*BS 4142 does not define 'low' in the context of background sound levels nor rating levels. The note to the Scope of the 1997 version of BS 4142 defined very low background sound levels as being less than about 30 dB L_{A90}, and low rating levels as being less than about 35 dB $L_{Ar,Tr}$*".

7.5.8 The ANC Guide suggests that: *"…similar values would not be unreasonable in the context of BS 4142, but that the assessor should make a judgement and justify it where appropriate*".

7.5.9 For gardens, a precautionary approach has been taken when defining the threshold for an adverse effect by applying a minimum level of 35 dB $L_{Ar,Tr}$, which is equivalent to the ambient level for relaxation within a property as referenced from BS 8233. A similar approach has been taken for night-time noise when defining the minimum threshold for adverse noise effects of 30 dB $L_{Ar,Tr}$, as referenced from BS 8233.

7.5.10 The assessment criteria for noise from fixed plant installations are summarised in **Table 7-7**. The assessment will be based on available information on the operating conditions and the levels of noise generated by the plant.

Table 7-7 Operational Noise Assessment Criteria

Significance of Effect	Rating Level (External) at Receptor, $L_{Ar,Tr}$	
	Daytime (07:00-19:00) and Evening (19:00-23:00)	Night-time (23:00-07:00)
Major	Greater than or equal to 10 dB above the background noise level – minimum of 45 dB $L_{Ar,Tr}$	Greater than or equal to 10 dB above the background noise level – minimum of 40 dB $L_{Ar,Tr}$
Moderate	Greater than or equal to 5 dB and less than 10 dB above the background noise level – minimum of 40-45 dB $L_{Ar,Tr}$	Greater than or equal to 5 dB and less than 10 dB above the background noise level – minimum of 35-40 dB $L_{Ar,Tr}$
Minor	Greater than or equal to the typical background level and less than 5 dB above the background noise level – minimum of 35-40 dB $L_{Ar,Tr}$	Greater than or equal to the typical background level and less than 5 dB above the background noise level – minimum of 30-35 dB $L_{Ar,Tr}$
Negligible	Less than or equal to the typical background level ($L_{A90,T}$) – minimum of 35 dB $L_{Ar,Tr}$	Less than or equal to the typical background level ($L_{A90,T}$) – minimum of 30 dB $L_{Ar,Tr}$

Non-residential Receptors

7.5.11 The approach to the assessment of non-residential receptors differs from that adopted for residential receptors. This is because guidance applied in the assessment is used to assess likely effects of noise on people at a dwelling used for residential purposes.

7.5.12 Design guides for good internal conditions in non-residential receptors are set indoors. The only non-residential receptor in this assessment are educational facilities (R27 and R32 identified in **Table 7-1**). Design criterion from BB93 specifies an internal noise level 35 dB LAeq,T in classrooms. Assuming that education facilities may have doors or windows open at some points during the year, the maximum external noise level (assuming 15 dB attenuation for a partially open door or window) before the design criterion would be exceeded would be 50 dB LAeq,T. Should this level be exceeded, additional mitigation measures may be required for the education facilities to continue to operate.

7.6 Embedded Mitigation

Construction Phase

7.6.1 Measures to control noise as defined in Annex B of BS 5228-1 and measures to control vibration as defined in Section 8 of BS 5228-2 will be adopted where reasonably practicable.

7.6.2 These measures represent ‘Best Practicable Means’ (BPM) (as defined by section 72 of COPA) to manage noise and vibration emissions from construction activities.

7.6.3 Embedded measures relevant to the construction phase will be described within a Framework CEMP that accompanies the Application.

Operational Phase

7.6.4 At this stage, no specific noise mitigation measures have been included for operational plant. Mitigation for operational plant will be designed and implemented where likely significant operational noise effects are identified.

7.7 Potential Effects

Construction

7.7.1 Potential noise and vibration effects during the construction phase are likely to arise from work activities. Additionally, noise effects may result from construction-related vehicle movements within the Site and along access routes. Although any noise and vibration effects arising from the construction phase impacts will be temporary and reversible with no lasting residual effect, an assessment of them will be included within the ES.

Operation

7.7.2 The Proposed Development would be a long-term operational noise source. This has the potential to generate likely significant effects at receptors within the study area. The Applicant proposes to agree with the Local Authority that noise (in terms of the BS 4142:2014+A1:2019 rating level) from the operation of the Proposed Development must be no greater than a minor impact (according to **Table 7-7**) impact during the daytime, evening and the night time periods adjacent to the nearest residential properties at such locations as agreed with the relevant planning authority. Consequently, this assessment criteria would be applied within the ES.

7.7.3 Operational traffic movements are expected to be limited, and as such, impacts to existing road traffic noise during the operational phase of the Proposed Development are also expected to be limited and not cause any likely significant effects. Consequently, potential operational impacts linked to traffic have been scoped out of the ES.

7.7.4 No major vibration sources would be introduced during operation, and as such there would be no associated operational vibration impacts. It is therefore proposed that operational vibration is scoped out of any further assessment and not included within the ES.

Decommissioning

7.7.5 Noise impacts which arise during the decommissioning phase of the Proposed Development will be similar or less than noise impacts during the construction phase. The noise assessment presented for the construction phase will therefore be considered representative (or an overestimate) of the decommissioning phase. As such a separate assessment for noise from the decommissioning phase is not proposed.

7.8 Summary of Potential Likely Significant Effects

7.8.1 A summary of elements to be scoped into or out of future assessment is provided in **Table 7-8**.

Table 7-8 Summary of the potential likely significant effects to be considered in the ES

Noise and Vibration	Scoped In	Scoped Out	Rationale for Scoping Out
Construction Phase	Noise emissions Vibration emissions Construction traffic noise	Construction noise and vibration from existing project elements (i.e. Existing Natural Gas Corridor and Repurposed CO_2 Connection Corridor)	No construction works are required for existing project elements excluding minor maintenance/upgrade works to be carried out from AGIs.
Operational Phase	Plant noise emissions	Operational traffic noise Plant vibration emissions Operational noise and vibration from existing project elements	Forecast operational traffic flows of 132 two-way light vehicle movements and 14 two-way HGV movements are not sufficient enough to result in a material change in road traffic noise levels. For context, it would require an increase in traffic flows of 25% (assuming equivalent traffic composition) to result in an increase in noise of 1 dB, which is the minimum perceptible change in noise to the most sensitive person. No sources of operational vibration that would be perceptible at sensitive receptors would be introduced There would be no change to the ambient noise environment from existing project elements
Decommissioning Phase		Noise emissions Vibration emissions Decommissioning traffic noise	Noise effects during the decommissioning phase of the Proposed Development will be similar or less than noise effects during the construction phase

8. Traffic and Transport

8.1 Introduction

8.1.1 This chapter sets out the proposed scope and methodology for the assessment of the effects of the Proposed Development on traffic and transport. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

8.1.2 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this Scoping Report and is supported by the following figures:

- **Figure 8-1:** Local Highway Network; and
- **Figure 8-2:** Proposed Locations for Traffic Surveys.

8.2 Legislation, Policy and Guidance

8.2.1 The EIA will include a review of, and make reference to, key legislation, policy and guidance at a national and local level.

Legislation

- Well-being of Future Generations (Wales) Act 2015; and
- Active Travel (Wales) Act 2013[80].

National Planning Policy

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- PPW; and
- Llwybr Newydd: the Wales Transport Strategy (2021)[81].

Local Planning Policy

- Adopted Flintshire LDP (2015-2030); and
- North Wales Joint Local Transport Plan (2015)[82].

[80] Active Travel (Wales) Act 2013 (anaw 7). London: HMSO.
[81] Welsh Government, 2021; *Llwybr Newydd: the Wales transport strategy* [online]. Available at: https://www.gov.wales/llwybr-newydd-wales-transport-strategy-2021 (Accessed 20/12/2023)
[82] Flintshire County Council, Conwy County Borough Council, Denbighshire County Council, Gwynedd Council, Isle of Anglesey County Council, and Wrexham County Borough Council, 2015; *North Wales Joint Local Transport Plan* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Planning/LDP-evidence-base/Local/North-Wales-Joint-Local-Transport-Plan-2015.pdf

Guidance

- DMRB: LA 104 – Environmental Assessment and Monitoring (2020)[83];
- Technical Advice Note 18: Transport (2007)[84]; and
- Environmental Assessment of Traffic and Movement (2023)[85] (IEMA Guidelines (Traffic)).

8.3 Assumptions, Limitations and Uncertainties

8.3.1 For the purposes of the assessment, the construction phase includes the enabling and demolition works required to facilitate the Proposed Development outlined in Section 3.3.

8.3.2 At this stage, available information regarding the construction and operational phases of the Proposed Development are commensurate with the application status. As is typical practice, a series of assumptions have been made in order to be able to conduct a robust assessment of the likely impacts of the Proposed Development on traffic and transport.

8.3.3 The assumptions used to inform the assessment will be set out in the ES, and are based on good industry practice, site-specific evidence and data (where possible), and professional judgement and experience. Assumptions have been made in regard to the following:

- the assessment has been based on the current development proposals as set out in **Chapter 3: The Proposed Development** of this Scoping Report.
- identification of estimated construction and operational trip generation and distribution; and
- derivation of future year traffic flow scenarios.

8.4 Baseline Conditions

Study Area

8.4.1 The traffic and transport study area will comprise the main highway links set out below and the public transport, cycle and walking provision within the immediate vicinity of these of these links. These relate to the Site and its surroundings. An initial desk-based baseline assessment has been undertaken to gather information on existing transport infrastructure, construction routes and restrictions to provide an overview of the study area, as defined by the highway links proposed for traffic surveys in paragraph 8.4.19, and the highway network and connections.

[83] National Highways/Welsh Government, 2020; Design Manual for Roads and Bridges: LA 104 – Environmental Assessment and Monitoring. Cardiff: Welsh Government.
[84] Welsh Government, 2007; *Technical Advice Note (TAN) 18: Transport* [online]. Available at: https://www.gov.wales/technical-advice-note-tan-18-transport
[85] IEMA, 2023; *Environmental Assessment of Traffic and Movement*. March: IEMA.

Local Highway Network

8.4.2 The following section provides a description of the characteristics of the local highway network within the study area. The roads described are labelled and shown on **Figure 8-1 (Appendix A).**

8.4.3 Access to the existing Connah's Quay Power Station (and access to the Main Site) is provided via Kelsterton Road. Kelsterton Road comprises a single carriageway, which provides a link between two roundabout junctions, these serving the internal site access road network and also the Strategic Road Network (SRN) in the form of the A548.

8.4.4 Kelsterton Road has an average total carriageway width of between 7.0 m and 7.5 m, with some localised widening on bends. It is well lit and subject to a speed limit of 20 mph. As well as providing access to the Main Site, Kelsterton Road serves eight private single-dwelling properties situated on the northern side of the A548.

8.4.5 The A548 routes directly to the south of the Main Site and comprises the nearest connection to the SRN. The A548 is a dual carriageway in the vicinity of the overall Site and subject to a speed limit of 70 mph. Beyond the locality of the Site, the A548 provides a strategic link along the alignment of the North Wales Main Line railway, extending as far west as Pensarn. The A548 bisects (via a bridge) the south-eastern part of the Site (across the Alternative Access to the Main Site and Access to Indicative Enhancement Area), crossing the River Dee via Flintshire Bridge. The A548 connects to the M56 and M53 to the north-east of the Site.

8.4.6 The B5129 connects to the A548 via a roundabout connection to the south of the Site and delivers access to the nearby urban settlements of Connah's Quay and Shotton. The B5129 provides secondary access to the south-east of the Site (entering the Alternative Access to the Main Site and Access to Indicative Enhancement Area), via a priority T-Junction with an unnamed access road, located opposite Coleg Cambria. The B5129 is subject to a 20 mph speed limit, has a carriageway width ranging between 7.0 m and 10.0 m, and forms a public transport bus route for services to Hollywell and Flint.

8.4.7 Kelsterton Lane is a north-south route that lies between the B5129 and Mold Road. Kelsterton Lane has a 7.5-tonne weight restriction and is signed as being unsuitable for wide vehicles, due to its narrow single carriageway. Kelsterton Lane appears typical of the types of routes that could be used for a rat-run for journeys between the Site and the A55 to the south. The Lane is subject to a 60 mph speed limit and primarily serves isolated farm properties.

8.4.8 Allt-Goch Lane/ Coed Onn Road is a single carriageway road that lies approximately 2.5 km to the west of the Main Site. The Proposed CO_2 Connection Corridor is situated on a parcel of land that lies directly to the east of Allt-Goch Lane, between Llwyn Onn and Coed Onn Road. Coed Onn Road comprises a continuation of Allt-Goch Lane (to the north), connecting to the A5119 in Flint. At its southern extent, Allt-Goch Lane connects to Starkey Lane, which in turn provides access to the A5119 to the south. At its northern extent, Coed Onn Road provides access to residential areas, has an average carriageway width between 6 m and 7 m and is subject to a 20 mph speed limit. Approximately 500 m to the south-east of St Mary's

Catholic Primary School, Coed Onn Road narrows significantly to a carriageway width of approximately 3 m to 4 m, is a single track in nature and has an associated speed limit of 60 mph within the vicinity of the Proposed CO_2 Connection Corridor.

8.4.9 Golftyn Lane connects to the B5129 via a priority T-Junction, located opposite the entrance of the Alternative Access to the Main Site and Access to Indicative Enhancement Area. Golftyn Lane acts as a key distributor road for the residential areas located to the south-east of the Site in Connah's Quay. It has an average carriageway width between 7 m and 8 m and is subject to a speed limit of 20 mph. Golftyn Lane also serves as a bus route and provides access to Deeside Sixth Form and Connah's Quay High School.

8.4.10 Mold Road performs a similar distributor function to Golftyn Lane and is accessed from the B5129, approximately 2.5 km south-east of the Site. Mold Road functions as one-way only for approximately 120 m in the southbound direction, between the B5129 and Pennant Street. Beyond this point, Mold Road reverts to two-way operation and is limited to 20 mph speeds. It primarily serves residential areas; however, it also provides a longer-distance route south-west towards Northop and the A55 North Wales Expressway.

8.4.11 The A5119 is accessed in Flint, approximately 4.5 km to the north-west of the Site. The A5119 provides a strategic connection to the A55 North Wales Expressway, which runs in a parallel alignment to the A548 and lies approximately 4 km to the south of Connah's Quay. The A55 North Wales Expressway serves as a key strategic route, both to areas located further west of the Site, as well as to the east and beyond into North-West England.

Walking and Cycling

8.4.12 There are varying levels or provision for walking and cycling on Kelsterton Road between the A548 and the access to the Main Site. This includes a 3 m-wide shared cycleway connecting to the roundabout junction with the A548, as well as a segregated footway on the northern side of Kelsterton Road. To the east of the internal roundabout junction, a narrow footway is present on the south side of the carriageway, leading up to the site access junction. A more substantial walking and cycling provision is available on local roads surrounding the site, such as the B5129 through Connah's Quay.

8.4.13 Public Rights of Way (PRoW) in the vicinity of the Main Site and the Proposed CO_2 Connection Corridor have been reviewed based on online mapping provided by FCC. There is a designated footpath that lies in close proximity to the south-eastern extent of the Main Site boundary. The footpath connects to the B5129, approximately 90 m to the east of its junction with Golftyn Lane and continues in a south-east direction, before terminating at Quay Business Park. A designated footpath intersects the field parcel containing the Proposed CO_2 Connection Corridor, forming a link between Allt-Goch Lane and the farm access road forming the northern boundary of the field parcel. The ES will consider the potential impact of the proposals on the route of these existing footpaths and whether any temporary or permanent diversion measures may be required.

8.4.14 National Cycle Network (NCN) Route 5 is located in close proximity to the Main Site, routeing along the A548 to the west of the Main Site, before connecting to Kelsterton Road and, subsequently, the B5129. NCN 5 is conveniently situated to accommodate cycle travel to / from the Main Site and connects to a wider network of routes to the north and north-east of the Site.

8.4.15 Walking and cycling route allocations and improvements, as identified by FCC as part of their obligations to the Active Travel (Wales) Act 2013, will be presented and discussed, as relevant to the Proposed Development, within the full Transport Assessment (TA) which will accompany the Application.

Public Transport

8.4.16 Public bus services are available in close proximity to the Main Site, with the nearest stops ('Cemetery Gates' and 'Kelsterton Lane') located on the B5129, within a short walking distance from the Main Site. Services 10A, 11, D1 and D2 are available from these stops and provide for journeys towards Flint and Chester. The nearest railway stations to the Site are located to the north-west in Flint and to the south-east in Shotton. The full range of services and their timetables will be reviewed and presented as part of the full TA.

Planned Surveys

8.4.17 Where information exists and is suitable for use, traffic data will be extracted from official sources. This may work to reduce the extent of new survey work.

8.4.18 Automatic Traffic Count (ATC) surveys will be undertaken over a seven-day period and during a 'neutral' month, defined as the period from March to November (excluding August, school holidays and periods affected by road works). It is currently envisaged that traffic surveys will take place in a neutral survey period, potentially the beginning of March 2024.

8.4.19 At this stage, it is proposed that data will need to be sourced for the following locations, which are indicated on **Figure 8-2 (Appendix A)**:

- Kelsterton Road;
- The A548 (east of the Main Site access);
- The A548 (west of the Main Site access);
- The B5129 (in the vicinity of the Main Site);
- Kelsterton Lane;
- Allt-Goch Lane (in relation to the Proposed CO_2 Connection Corridor);
- Golftyn Lane; and
- Mold Road.

8.4.20 The Traffic and Transport chapter of the ES will expand on the baseline information collected and include the following:

- description of the local highway network within the study area – further details of carriageway widths, speed limits, street lighting, footways / cycleways, parking restrictions, junction types and PRoW;

- description of the local highway operational conditions – including both quantitative (based on traffic survey data – see above) and qualitative (on-site observations);
- identification of sustainable travel links (walking, cycling and public transport); and
- analysis of Personal Injury Collision (PIC) data for the study area – it is proposed that the analysis will cover the most recent five-year period for which data is available, to be agreed with the Local Highway Authority (LHA).

Sources of Information

8.4.21 The following sources of information will be reviewed to inform the baseline for the ES chapter:

- relevant Traffic Count data, to determine the levels of baseline traffic on the network under consideration;
- PIC data for the most recent five-year period will be obtained from the relevant Highway Authority, or sourced online via Crashmap, for all roads within the proposed study area. This will provide information on each collision including severity as well as factors which attributed to the collision, which will help to identify principal areas of concern;
- travel mode share data from the 2011 Census, or 2021 Census if available; and
- newly commissioned traffic count data where required.

8.5 Impact Assessment Methodology

8.5.1 The Traffic and Transport chapter of the ES will be supported by a TA, which will be included as an appendix. The TA will consider relevant planning policy, a review of the existing land use and setting, PIC record analysis, the potential trip generation of the Proposed Development, during construction, and how this will affect the surrounding highway network. It will also include high-level information with regards to the mitigation strategy, such as potential measures for the management of construction traffic.

8.5.2 The Traffic and Transport chapter of the ES will include an assessment of baseline conditions within the identified study area. Baseline levels of traffic will be established from appropriate sources, as discussed below. Traffic data will be ‘growthed’ to an appropriate assessment year, which will be set out for agreement with the LHA and shared with other potential stakeholders, such as National Highways or the Welsh Government, as part of the TA scoping discussions.

8.5.3 Other potential traffic related effects are considered under other topics including:

- traffic effects relating to Air Quality which will be considered in **Chapter 6: Air Quality**;
- temporary noise and vibration effects resulting from construction traffic which will be considered in **Chapter 7: Noise and Vibration**;

- potential effects of construction traffic on sites of ecological and nature conservation value which will be considered in **Chapter 9: Terrestrial and Aquatic Ecology**;
- recreation and tourism which will be considered in **Chapter 16: Socio-Economics, Recreation and Tourism;** and
- potential effects on human health related to choice of transport modes, access and connections which will be considered in **Chapter 18: Human Health**

Establishing the Baseline

8.5.4 The ES study area will comprise the highway network as set out in Section 8.4. These highways will form part of routeing arrangements for construction traffic associated with the Proposed Development. The study area will include any PRoW in the vicinity of the Site. This may need to be refined or extended, subject to consultation with key stakeholders.

8.5.5 Baseline conditions will be initially identified from desk-based research and confirmed and supplemented by the findings of a walkover site visit, as appropriate. There will be a need to understand the baseline traffic flows and operating conditions on the local highway network to determine the effect of the Proposed Development. PIC data for the most recent five-year period will be obtained and interrogated for the roads within the proposed study area. This will provide information on each collision including severity as well as factors which attributed to the collision, which will help to identify if there are any principal areas of concern.

Construction

8.5.6 Using Rochdale Envelope principles, the assessment of the impact of the construction phase will cover the expected construction programme, working hours and days; potential methods of construction, the resulting broad quantities of materials required, and anticipated labour resourcing; a works phasing strategy with a view to understanding what materials will be required and when, and the number of resulting deliveries throughout the construction period, including consideration of:

- type, size, frequency and number of construction vehicles;
- construction workforce transport arrangements – to include assumptions on the number of staff and shift patterns and modes of travel; and
- construction traffic access strategy, in order that routes to the Site (and Site elements) can be determined.

8.5.7 Forecasts for construction trip generation will be informed by the expected construction programme. This includes the anticipated average and peak activity daily totals for HGV associated with construction deliveries, as well as average and peak activity daily totals for cars / LGV, associated with construction workers attending the Site.

8.5.8 Initial estimates suggest that around 1,000 construction workers could be contracted at the peak construction activity of Phases 1 and 2 in the event that construction of Train 1 and Train 2 was phased. If a single phase approach is adopted for both Train 1 and 2, it is anticipated that

approximately 1,600 construction workers could be contracted at the peak construction activity of the single phase.

8.5.9 **Table 8-1** sets out the indicative forecast for HGV / LGV / Car movements associated with Train 1 (Phase 1) or a combined Train 1 and 2 (single phase) of the Proposed Development. These figures are early estimates that could change as the design progresses.

Table 8-1 Anticipated Indicative HGV / Car / LGV Movements During Construction Period

Movement	Peak Daily Movements (Month 18)		
	HGV	Car / LGV (associated with construction workers) Phase 1 or single phase	Total Phase 1 or single phase
Inbound	100	408 or 650	508 or 750
Outbound	100	408 or 650	508 or 750
Two-Way	**200**	**816 or 1,300**	**1,016 or 1,500**

Source: Table 3-10, Environmental Impact Assessment Inputs Summary

8.5.10 **Table 8-1** indicates that during the peak time of construction (approximately 18 months into the construction programme), if two phases are adopted there could be a typical daily maximum of around 1,016 vehicle movements to / from the Main Site including 200 HGV movements and 816 LGV / Car movements, and if a single phase is adopted there could be a typical daily maximum of around 1,500 vehicle movements to / from the Main Site including 200 HGV movements and 1,300 LGV / Car movements. In both cases, these movements would be associated with the transport of construction workers to / from the Main Site. These would be spread over a full working day. It is anticipated that typical core construction working hours (07:00 to 19:00 Monday to Friday and 07:00 to 13:00 Saturday) are likely to be used to avoid construction workers travelling during the AM and PM peak periods.

8.5.11 In addition to the above, there would also be vehicle movements associated with the other key elements of the Proposed Development, including, Proposed CO_2 Connection Corridor, Water Connection Corridor, Electrical Connection Corridor, and Indicative Enhancement Area. These figures will be reported within the ES. Indicatively it is estimated that during construction within the Proposed CO_2 Connection Corridor, up to ten workers could be contracted, including supervision.

8.5.12 The distribution of construction traffic associated with the Proposed Development onto the local highway network will be informed by the likely routeing arrangements, which will be secured through the Construction Traffic Management Plan (CTMP).

8.5.13 The assessment of the construction phase will align with the peak in construction traffic movements.

8.5.14 The focus of the traffic impact assessment will be on the changes in link flows with the addition of the traffic associated with the Proposed Development to the baseline. A classification of link sensitivity will be made in line with IEMA Guidelines (Traffic).

8.5.15 An illustrative spreadsheet model will be prepared, presenting the traffic flows within the study area for each of the assessment scenarios. Traffic flows from the spreadsheet model will be used to identify the absolute and the percentage impacts of the Proposed Development on the identified links.

Operation

8.5.16 The approach to the assessment of the effects of the Proposed Development during the operational phase will be subject to review of forecasts for operational traffic generation. Should these be of a level where thresholds set out in the IEMA Guidelines (Traffic) are not exceeded, the effects will be described in qualitative terms but an assessment will be scoped out of the ES.

8.5.17 Based on the current indicative programme set out in **Chapter 3: The Proposed Development**, the Site is anticipated to be fully commissioned (with Train 1 and Train 2, or combined single phase) and commercially operational in late 2035. **Table 8-2** shows the total number of staff for each position or work area during operation of the Proposed Development. This illustrates the anticipated number of staff working on the site during a typical day. These figures are indicative early estimates that could change as further design information is progressed.

Table 8-2 Estimated Staffing Numbers During Operation of the Proposed Development

Personnel Type	Quantity per Day
Office: Management	3
Office: Technical	12
Office: Administration	5
Control Room Operators	5
Field Engineers: Mechanical Fitter	4
Field Engineers: Electrical Technician	4
Field Engineers: Instrument Technician	4
Field Engineers: Outside Operator	3
Field Engineers: Water Plant / Laboratory	1
Maintenance / Workshop	20
Security	3
Cleaners / Facilities	2
Total	66

Source: Table 6-1, Environmental Impact Assessment Inputs Summary

Assessment Criteria

8.5.18 The assessment of traffic impacts will be carried out in accordance with the IEMA Guidelines (Traffic).

8.5.19 The IEMA Guidelines (Traffic) identify a number of environmental effects, including:

- Severance;
- Pedestrian Amenity;
- Fear and Intimidation;
- Road User and Pedestrian Safety;
- Hazardous Loads; and
- Driver Delay.

8.5.20 The IMEA Guidelines (Traffic) suggests two rules which can be used to identify the appropriate extent of the assessment area, as follows:

- Rule 1 – Include road links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
- Rule 2 – Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

8.5.21 Effects are classified by the interaction of the sensitivity of receptor and the magnitude of change.

8.5.22 Paragraph 1.30 of the IEMA Guidelines (Traffic) defines sensitive locations as receptors that are sensitive to traffic, which could include, but are not limited to: schools, hospitals, places of worship and historical buildings. **Table 8-3** shows the types of receptors which fall into the different categories of sensitivity based on the potential impact of increases in traffic flows, as set out in the IEMA Guidelines (Traffic).

Table 8-3 Sensitivity of Receptors

Sensitivity	Definition
High	Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident blackspots, retirement homes, urban/residential roads without footways that are used by pedestrians.
Medium	Traffic flow sensitive receptors including: congested junctions, doctor's surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, un-segregated cycleways, community centres, parks, recreation facilities.
Low	Receptors with some sensitivity to traffic flow: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision.
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distanced from affected roads and junctions.

8.5.23 Potential traffic impacts are considered to be of high, medium, low or very low magnitude. the magnitude of traffic impacts is defined in **Table 8-4**, and the criteria for fear and intimidation has been amended to reflect the use of the IEMA Guidelines (Traffic).

Table 8-4 Traffic and Transport Assessment Framework – Magnitude of Impacts

Type of Impact	Magnitude of Impact			
	Very Low	Low	Medium	High

Severance	Change in total traffic flow of < 30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 61% to 90%	Change in total traffic flow of >90%
Pedestrian amenity	Changes in traffic flow (or HGV component) less than 50%	Changes in traffic flow (or HGV component) of 50% to 100%	Changes in traffic flow (or HGV component) of 101% to 150%	Change in traffic flow (or HGV component) of >150%
Fear and intimidation	No change in step changes	One step change in level, with <400 veh increase in average 18hr AV two-way all vehicle flow; and/or <500 HV increase in total 18hr HV flow	One step change in level, but with >400 veh increase in average 18hr AV two-way all vehicle flow; and/or >500 HV increase in total 18hr HV flow Two step changes in level	Two step changes in level
Highway safety	Magnitude of impact derived using professional judgment informed by the frequency and severity of recorded collisions within the study area and the forecast increase in traffic			
Hazardous Loads	Magnitude of impact derived using professional judgment informed by the frequency and routing of hazardous loads within the study area and the forecast increase in traffic			
Driver delay	Magnitude of impact derived using professional judgment informed by the increase in vehicle delay and whether a junction is at, or close to capacity			

8.5.24 The magnitude of change and the sensitivity of the receptor will then be compared to determine the classification of the effect as per IEMA Guidelines (Traffic).

8.5.25 Following the classification of effects, a clear statement will be made as to whether any effects are likely to be ‘significant’ or ‘not significant’. The significance of an effect, and whether an effect is regarded as ‘significant’ for assessment purposes, is determined as a factor of the magnitude of the impact and the sensitivity of associated receptors.

8.6 Embedded Mitigation

8.6.1 The TA and ES Chapter will work to identify any locations where the transport impact may require mitigation. Embedded mitigation will be determined through technical analysis and discussions with the LHA and Welsh Government, as appropriate. The ES Chapter will provide an appropriate level detail of any necessary mitigation, supported by the TA.

8.6.2 The assessment of the likely significance of effects will take into account embedded mitigation measures, such as those that will be incorporated into the Proposed Development or are standard practice.

8.6.3 In terms of traffic and transportation, it is envisaged that a CTMP and Construction Worker Management Plan (CWMP) will form part of the embedded mitigation. Framework CTMP and CWMP will be prepared as part of the Application, providing an overview of proposed construction (including AIL) traffic routes and associated management measures, including proposals for management of any affected PRoW. This will provide a

framework of measures and principles to be taken forward and developed further by the appointed contractor.

8.7 Potential Effects

Construction

8.7.1 The construction phase will give rise to an increase in HGV (for deliveries) and light vehicle (construction staff) movements on the highway network. The impacts of an increase in traffic during construction will be examined as part of the assessment. Any effects associated with construction will be temporary and short-term.

8.7.2 Construction impacts will be managed through the final contractor CTMP/ CWPM, secured via Requirements of the draft DCO; the measures of which would be intended to protect the environment, amenity and safety of local residents, businesses, the general public and the surroundings in the vicinity of the Proposed Development. These plans will also include general reference to any measures likely to be required as part of the construction of ancillary infrastructure, with the detail of items such as any potential road closures and associated proposals for diversions subject to further discussion and agreement with the LHA.

Operation

8.7.3 The operational phase will give rise to an increase in vehicle movements associated with permanent staffing requirements, visitors and deliveries.

8.7.4 Once operational, it is anticipated that 66 permanent roles will be created once Trains 1 and 2 are operating. Staff will be required on a shift basis to be spread over a 24-hour period. Conservatively assuming that each member of staff travel to / from work by single-occupancy vehicle, this could equate to up to circa 132 two-way light vehicle movements per day. In reality, there is likely to be an element of car sharing between staff members. Given the site is well-accessed by public transport (both bus and rail), it is likely that a proportion of staff members will utilise modes other than the private car to travel to / from work.

8.7.5 In addition to staff trips, there is potential that up to seven HGV (tankers) of wastewater would be removed from Site per day, equating to an additional 14 two-way HGV movements. This represents a worst-case scenario in the absence of suitable water treatment within the Site.

8.7.6 In addition to typical operational requirements, there will be a need for planned maintenance outages. A worst-case staff attendance for such activities could be up to 300 workers. These events are managed and occur at the frequency of around once every four years, and they last around two months or 60 days, as a representative period.

8.7.7 Overall, the scale of potential traffic proposed is not considered to require an assessment of the operational phase within the ES, and therefore, it is proposed that this element is scoped out with a qualitative statement regarding operational traffic presented within the TA.

Decommissioning

8.7.8 It is not proposed to undertake a separate assessment of the decommissioning phase due to the 30-year lifecycle of the Proposed Development, and the uncertainties over the ability to predict future baseline conditions at that time. The emerging policy and needed changes to vehicle use in the UK could provide a very different landscape for assessment in 30 years' time.

8.7.9 At the end of its operating life, the most likely scenario is that the Proposed Development would be shut down and all above ground structures would be removed from site. Traffic impacts which could arise during the decommissioning phase of the Proposed Development are likely to be similar or less than impacts during the construction phase. The traffic assessment presented for the construction phase will therefore be considered representative (or an overestimate) of the decommissioning phase.

8.8 Summary of Potential Likely Significant Effects

8.8.1 A summary of elements to be scoped into or out of future assessment is provided in **Table 8-5**.

Table 8-5 Summary of the elements to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Transport			
Construction	The construction phase will give rise to an increase in HGV (for deliveries) and light vehicle (construction staff) movements on the highway network. The impacts of a temporary increase in traffic during construction will be examined as part of the assessments.		
Operation		Operational Traffic Assessment	The scale of potential traffic proposed is not considered to require an assessment of the operational phase within the ES Chapter i.e. up to circa 66 permanent roles created once Trains 1 and 2 are operating.
Decommissioning		Decommissioning Traffic Assessment	It is not proposed to undertake any assessment of the decommissioning phase due to the 30-year lifecycle of the Proposed Development, and the uncertainties over accurately predicting the baseline conditions across that length of time, with any impact confirmed likely to be similar to that assessed at the construction phase.

9. Terrestrial and Aquatic Ecology

9.1 Introduction

9.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on terrestrial and aquatic ecology. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

9.1.2 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report. This chapter should also be read in conjunction with **Chapter 6: Air Quality**, **Chapter 7: Noise and Vibration, Chapter 10: Marine Ecology**, **Chapter 11: Water Environment and Flood Risk**, and **Chapter 13: Landscape and Visual Amenity**.

9.1.3 This chapter is also supported by the following figures:

- **Figure 9-1:** Habitat Sites and National Designated Sites within 15 km;
- **Figure 9-2:** National and Local Statutory Designated Sites within 2 km;
- **Figure 9-3:** Ancient Woodlands and Priority Habitats within 2 km; and
- **Figure 9-4:** Indicative UK Habitats.

9.1.4 This chapter covers terrestrial ecology, aquatic ecology and ornithology above the Mean High-Tide Water Springs level (MHWS). Impacts on ecology below the MHWS is detailed in **Chapter 10: Marine Ecology**.

9.2 Legislation, Policy and Guidance

9.2.1 The key pieces of legislation in the UK relating to nature conservation are:

- The Habitats Regulations (as amended);
- Wildlife and Countryside Act 1981[86] (as amended);
- Environment Act 2021;
- Environment (Wales) Act 2016[87];
- Countryside and Rights of Way (CRoW) Act 2000[88] for England and Wales;
- Natural Environment and Rural Communities (NERC) Act 2006[89];
- Protection of Badgers Act 1992[90];
- The Hedgerow Regulations 1997[91];

[86] *Wildlife and Countryside Act 1981* (c. 69). London: HMSO.
[87] *Environment (Wales) Act 2016* (anaw 3). London: HMSO.
[88] *Countryside and Rights of Way Act 2000* (c. 37). London: HMSO.
[89] *Natural Environment and Rural Communities Act 2006* (c. 16). London: HMSO.
[90] *Protection of Badgers Act 1992* (c. 51). London: HMSO.
[91] *The Hedgerow Regulations 1997* (SI 1997/1160). London: HMSO.

- Wild Mammals (Protection) Act 1996[92];
- The Water Environment (Water Framework Directive) (WFD) (England and Wales) Regulations 2017[93];
- The Water Framework Directive (WFD) (Standards and Classifications) Directions (England and Wales) 2015[94];
- Salmon and Freshwater Fisheries Act (SAFFA) (as amended) 1975[95];
- The Eels (England and Wales) Regulations 2009 (Eels Regulations); and
- Regulation 1143/2014[96] on Invasive Alien Species (Enforcement and Permitting) Order 2019[97].

9.2.2 National planning policy relating to nature conservation includes:

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- The NP;
- PPW 2023; and
- Updated National Planning Policy for Chapter 6 of Planning Policy Wales 2023[98].

9.2.3 Local policy and plans relating to nature conservation include:

- FCC LDP. Relevant policies include:
  - Policy STR13: Natural and Built Environment, Green Networks and Infrastructure
  - Policy EN2: Green Infrastructure
  - Policy EN3: Undeveloped Coast and Dee Estuary Corridor
  - Policy EN6: Site of Biodiversity Importance
  - Policy EN7: Development Affecting Trees, Woodland and Hedgerows
- FCC Biodiversity Plan '*Supporting Nature in Flintshire 2020-2023*'[99]; and,

[92] *Wild Mammals (Protection) Act 1996* (c. 3). London: HMSO.
[93] *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017* (SI 2017/407). London: HMSO.
[94] *The Water Framework Directive (Standards and Classification) Directions (England and Wales)* (SI 2015/1623). London: HMSO.
[95] *Salmon and Freshwater Fisheries Act 1975* (c. 51). London: HMSO.
[96] Regulation (EU) No 1143/2014 of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species. *Official Journal* L317:35. Luxembourg: Publications Office of the European Union.
[97] *Invasive Alien Species (Enforcement and Permitting) Order 2019* (SI 2019/527). London: HMSO.
[98] Welsh Government, 2023; *Annex to Heads of Planning Letter Dated 11 October 2023: Addressing the Nature Emergency through the Planning System: Updated National Planning Policy for Chapter 6 of Planning Policy Wales* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2023-10/annex-addressing-the-nature-emergency-through-the-planning-system.pdf
[99] Flintshire County Council, 2020; *Supporting Nature in Flintshire; Out plan to maintain and enhance biodiversity under the Environment (Wales) Act 2016* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Countryside–Coast/Biodiversity/Flintshire-County-Council-Environment-Act-Section-6-Biodiversity-Duty-Delivery-Plan-update-2020.pdf

- Habitat Regulations Assessment (HRA) to Inform the assessment of the FCC LDP[100].

9.2.4 Key guidance (including survey methodologies) relating to nature conservation includes:

- Chartered Institute of Ecology and Environmental Management (CIEEM) good practice guidelines[101] (the CIEEM Guidelines);
- CIEEM Preliminary Ecological Appraisal (PEA) Guidance[102] (the CIEEM PEA Guidance);
- CIEEM Ecological Impact Assessment (EcIA) Guidance[103] (the CIEEM EcIA Guidance); and
- Statutory Biodiversity Metric Guidance[104].

9.3 Assumptions, Limitations and Uncertainties

9.3.1 Where uncertainty exists, this will be outlined in the limitations section of the impact assessment chapter for Terrestrial and Aquatic Ecology. The limitations presented by any uncertainty will be taken into account in defining the reasonable worst-case scenario for the Terrestrial and Aquatic Ecology assessment.

9.3.2 For the purposes of the assessment the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

9.3.3 A PEA was carried out in November 2023, which was within a suboptimal time of year for habitat assessments. However, sufficient information was gathered to inform this scoping report and provide recommendations for further ecological survey, as appropriate.

9.3.4 No works are proposed to the Repurposed CO_2 Connection Corridor or Existing Natural Gas Connection Corridor as described in **Chapter 3: the Proposed Development**. A desk-study appraisal of these areas has been carried out to inform this scoping chapter; however no further surveys or assessment requirements are anticipated.

9.3.5 This scoping chapter has been informed by data collected in 2021 by Aspect Ecology (see **Annex E** within **Appendix B Preliminary Ecological Appraisal**) and other freely available information within the public domain. A full data request for the Site will be made to the Local Biodiversity Record Centre (i.e., North Wales Environmental Information Service (Cofnod)) to inform the PEIR and ES.

[100] Arcadis, 2023; *Habitat Regulations Assessment to inform the assessment of the Flintshire Local Development Plan. HRA Matters Arising Changes Addendum – Adoption Update* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Planning/Examination-Library-Documents/Final-Habitats-Regulations-Assessment.pdf
[101] CIEEM, 2021; *Good Practice Guidance for Habitats and Species. Version 3. May 2021* [online]. Available at: https://cieem.net/resource/good-practice-guidance-for-habitats-and-species/
[102] CIEEM, 2017; *Guidelines for Preliminary Ecological Appraisal. 2nd edition*. Winchester: Chartered Institute of Ecology and Environmental Management.
[103] CIEEM, 2022; *Guidelines for Ecological Impact Assessment in the UK and Ireland. September 2018. Version 1.2 – Updated April 2022* [online]. Available at: https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/
[104] DEFRA, 2023; *Statutory biodiversity metric tools and guides; Tools and guides for measuring the biodiversity value of habitat for biodiversity net gain (BNG)* [online]. Available at: https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides

9.4 Baseline Conditions

9.4.1 The baseline for terrestrial and aquatic ecology is considered against the 'Zone of Influence' (ZoI) for the Proposed Development. The ZoI is the area over which ecology and nature conservation features may be affected by biophysical changes that may result from the Proposed Development and associated activities (CIEEM EcIA Guidance). The study area for baseline data gathering has been defined on a precautionary basis to inform the ZoI for the purpose of the EcIA. The approach taken is described below.

9.4.2 A 15 km study area around the Main Site has been applied to identify statutory Habitat Sites (formerly known as International Sites), SSSIs and National Nature Reserves (NNRs) to be considered in terms of the potential for impacts and effects (including for the purposes of HRA), including those supporting mobile species such as birds or marine mammals[105]. The assessment will initially consider features within a potential ZoI of up to 15 km from the Main Site based upon guidance for air quality impact assessment during operation as outlined in **Chapter 6: Air Quality** of this report.

9.4.3 The study area for the identification of local non-statutory nature conservation sites, and for gathering third party records of habitats and protected and notable species is a more focused area of 2 km around the Site. This distance is informed by standard guidance for air quality impact assessment and other good practice (CIEEM PEA and EcIA Guidance). The potential ZoI for the Proposed Development will be refined further for the purposes of the final EcIA.

Sources of Information

9.4.4 The desk study data sources and search areas are summarised in **Table 9-1**.

Table 9-1 Sources of Desk Study Data Gathered to Date

Data Source	Search Area	Accessed / Data / Received	Data Obtained
Multi Agency Geographic Information for the Countryside (MAGIC)[106]	Up to 15 km	November 2023	15 km for Habitat Sites, SSSIs and NNRs. 2 km for all other features (local statutory designations, ancient woodland, European Protected Species records, priority habitats).
Joint Nature Conservation Committee (JNCC) website[107]	Up to 15 km	November 2023	Reasons for designation and other information on Habitat and Ramsar sites.

[105] Note as marine ecology is a separate stand-alone topic chapter, further information on the baseline and scope of assessment of specific relevance to marine ecology is outlined separately in **Chapter 10: Marine Ecology** of this EIA Scoping Report.
[106] DEFRA, 2023; *Multi-Agency Geographic Information for the Countryside* [online]. Accessed here: https://magic.defra.gov.uk/
[107] JNCC, 2023; *JNCC* [online]. Available at: https://jncc.gov.uk/

Data Source	Search Area	Accessed / Data / Received	Data Obtained
Data Map Wales[108]	Up to 2 km	November 2023	2 km for Local Nature Reserves (LNRs)
Phase 1 Habitat and Faunal Survey – Northern[109] and Southern[110] Land Parcel (see **Annex E within Appendix B Preliminary Ecological Appraisal**)	Up to 2 km*	August 2021 and April 2023	2 km for non-statutory designated sites (Local Wildlife Sites (LWS)) and protected and notable habitats and species recorded from survey information.
Breeding, Passage and Wintering Bird Surveys Northern[111] and Southern[112] Land Parcel	The Site* (i.e., Main Site and Indicative Enhancement Area) and adjacent areas	April 2022 to February 2023	Bird survey data for breeding and wintering activity
Reptile Surveys Northern[113] and Southern[114] Land Parcel	The Site* (i.e., Main Site and Indicative Enhancement Area)	May 2022	a. Reptile survey data
National Biodiversity Network (NBN) Atlas (commercially available data according to licensing criteria)	Up to 2 km	November 2023	b. European Eel (*Anguilla Anguilla*)

** The Site referenced here, in relation to the Aspect Ecology Reports, is based on a previous version of the Site boundary, which has subsequently been updated. Refer to Site Location Plan 6322/ECO1 within these reports. The Site boundary at that time excluded the Proposed CO_2 Connection Corridor, Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor.*

9.4.5 An Initial PEA field survey was carried out in November 2023 to reaffirm the habitats present and appraise the habitats for their suitability to support protected and notable species (as previously identified by Aspect Ecology between 2021 and 2023). The field survey area included land within the Site plus up to 50 m (where accessible), excluding the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor. This initial PEA field survey was carried out at the sub-optimal time of year and will be updated following further survey planned in 2024. Species-specific field surveys will also be carried out as recommended within the PEA Report

[108] Welsh Government, 2023; *Data Map Wales. Data and Maps from the Welsh public sector* [online]. Available at: https://datamap.gov.wales/
[109] Aspect Ecology, 2023a; *Connah's Quay Power Station: Northern Land Parcel, Phase 1 Habitat and Faunal Surveys*
[110] Aspect Ecology, 2023b; *Connah's Quay Power Station: Southern Land Parcel, Phase 1 Habitat and Faunal Surveys*
[111] Aspect Ecology, 2023c; *Connah's Quay Power Station: Northern Land Parcel, Breeding, Passage and Wintering Bird Surveys*
[112] Aspect Ecology, 2023d; *Connah's Quay Power Station: Southern Land Parcel, Breeding, Passage and Wintering Bird Surveys*
[113] Aspect Ecology, 2023e; *Connah's Quay Power Station: Northern Land Parcel, Reptile Surveys*
[114] Aspect Ecology, 2023f; *Connah's Quay Power Station: Southern Land Parcel, Reptile Surveys*

(refer to **Appendix B**). The species-specific survey areas are presented in **Table 9-5**.

Statutory Designated Sites

9.4.6 As illustrated on **Figure 9-1** and **9-2 (Appendix A)**, **Table 9-2** and **Table 9-3** present the Habitat Sites and SSSIs located within 15 km of the Main Site.

Table 9-2 Habitat Sites located within 15 km of the Site

Designated Site	Summary of Citation	Approximate location
The Dee Estuary SPA	Designated for supporting over wintering bird species including: Bar-tailed godwit (*Limosa lapponica*) Black-tailed godwit (*Limosa limosa islandica*) Curlew (*Numenius arquata*) Dunlin (*Calidris alpina alpina*) Grey plover (*Pluvialis squatarola*) Knot (*Calidris canutus*) Oystercatcher (*Haematopus ostralegus*) Pintail (*Anas acuta*) Redshank (*Tringa tetanus*) Shelduck (*Tadorna tadorna*) Teal (*Anas crecca*) The site also supports breeding common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*), as well as supporting on passage sandwich tern (Sterna sandvicensis) and redshank (*Tringa tetanus*). The SPA regularly supports >20,000 waterfowl.	Overlaps with the Site, specifically the Water Connection Corridor.
The Dee Estuary Ramsar	Criterion for its designation includes, Wintering and passage waterfowl populations. The estuary supports internationally important numbers of waterfowl and waders. Estuarine and maritime habitats including, mud flats, sand flats and saltmarsh. Breeding colonies of natterjack toad (*Epidalea calamita*).	Overlaps with the Site, specifically the Water Connection Corridor.
The Dee Estuary / Aber Dyfrdwy SAC	Designated for its mudflat and sandflat habitats, not covered by seawater at low tide: *Saliconia* and other annuals colonising mud and sand; Atlantic salt meadows (*Glauco-Piccinellietalia maritimae*); estuaries; annual vegetation of drift lines; vegetated sea cliffs of the Atlantic and Baltic Coasts; embryonic shifting dunes; shifting dunes along the shoreline; fixed dunes with herbaceous vegetation and humid dune slacks. The site also supports sea lampreys (*Petromyzon marinus*) and river lampreys (*Lampetra fluviatillis*) and petalwort (*Petalophyllum ralfsii*).	Overlaps with the Site, specifically the Water Connection Corridor.
The River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC	Designated for the presence of the Annex 1 habitat Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-batrachion* vegetation; and its populations of the Annex II species Atlantic salmon *Salmo salar* and floating water plantain *Luronium natans*. Annex II qualifying features for selection of the site include	Located adjacent to the Site.

Designated Site	Summary of Citation	Approximate location
	sea Lamprey, river lamprey, petalwort, and bullhead (*Cottus gobio*).	
Deeside and Buckley Newt Sites SAC	Designated for its great crested newt (*Triturus cristatus)* population, one of the largest in Great Britain.	Located approximately 1.5 km south of the Site.
Halkyn Mountain / Mynydd Helygain SAC	Designated primarily for the presence of Annex 1 habitats Calaminarian grasslands of the *Violetalia calaminariae*; and Annex II species great crested newt.	Located approximately 3.6 km west of the Site.
Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC	Designated primarily for the Annex 1 habitat Tilio-Acerion forests of slopes, screes and ravines; holding one of the largest continuous areas of Tilio-Acerion fores in Wales.	Located approximately 6.8 km to the south-west of the Site.

Table 9-3 SSSIs[115] located within 15 km of the Site

Designated Site	Approximate Location
Dee Estuary / Aber Afon Dyfrdwy SSSI	Overlaps with the Site, specifically the Water Connection Corridor
Afon Dyfrdwy (River Dee) SSSI	Located approximately 0.1 km south-east of the Site
Shotton Lagoons and Reedbeds SSSI	Located approximately 0.2 km east from the Site
Mynydd Y Fflint / Flint Mountain SSSI	Located approximately 0.5 km west of the Site
Dee Estuary SSSI	Located approximately 1.3 km north of the Site
Inner Marsh Farm SSSI	Located approximately 1.3 km north of the Site
Connah's Quay Ponds and Woodland SSSI	Located approximately 1.5 km south of the Site
Comin Helygain a Glaswelltiroedd Treffynnon / Halkyn Common and Holywell Grasslands SSSI	Located approximately 3.6 km west of the Site
Buckley Claypits and Commons SSSI	Located approximately 4 km south of the Site
Maes y Grug SSSI	Located approximately 4 km south of the Site
Hallwood Farm Marl Pit SSSI	Located approximately 6 km north-east of the Site
Herward Smithy SSSI	Located approximately 6.3 km north-west of the Site
Parc Linden, Lixwm SSSI	Located approximately 6.8 km west of the Site
Tyddyn-y-barcut SSSI	Located approximately 6.8 km south-west of the Site
Alyn Valley Woods and Alyn Gorge Caves SSSI	Located approximately 6.8 km south-west of Site
Parc Bodlondeb and Gwenallt-parc, Lixwm SSSI	Located approximately 7.2 km west of the Site
Pen-y-Cefn Pasture SSSI	Located approximately 7.5 km south-west of the Site
Cefn Meadow SSSI	Located approximately 7.7 km east of the Site
Chwarel Cambrian / Cambrian Quarry, Gwernymynydd SSSI	Located approximately 9 km south-west of the Site
Dibbinsdale SSSI	Located approximately 9.2 km to the north of the Site
Heswall Dales SSSI	Located approximately 9.8 km to the north-west of the Site

[115] No online citations available to download.

Designated Site	Approximate Location
Dee Cliffs SSSI	Located approximately 10.3 km to the north-west of the Site
River Dee (England) SSSI	Located approximately 10.7 km to the south-east of the Site
Ddol Uchaf SSSI	Located approximately 10.7 km west of the Site
The Dungeon SSSI	Located approximately 11.1 km to the north-west of the Site
Mersey Estuary SSSI	Located approximately 11.2 km to the north-east of the Site
Coed Trefraith SSSI	Located approximately 11.6 km north-west of the Site
Coed Talon Marsh SSSI	Located approximately 11.6 km north-west of the Site
Caerwys Tufa SSSI	Located approximately 12 km west of the Site
Bryn Alyn SSSI	Located approximately 12.2 km west of the Site
Thurstaston Common SSSI	Located approximately 12.5 km north-west of the Site
New Ferry SSSI	Located approximately 13.2 km north-east of the Site
Glaswelltiroedd Eryrys (Eryrys Grasslands) SSSI	Located approximately 13.3 km south-west of the Site
Graig, Llanarmon-yn-Ial SSSI	Located approximately 14.5 km south-west of the Site
Chwarel Singret SSSI	Located approximately 14.9 km south of the Site

9.4.7 There are no NNRs within 15 km of the Site.

9.4.8 As illustrated on **Figure 9-2** (**Appendix A)**, there is one LNR within 2 km of the Site: Gathering Grounds Woods & Llywyni Pond LNR, located approximately 1.5 km south-east of the Site.

Non-Statutory Designated Sites

9.4.9 The Local Biodiversity Record Centre (i.e., North Wales Environmental Information Service (Cofnod)) will be contacted to request desk study information. From a review of desk study data carried out by Aspect Ecology in August 2021, **Table 9-4** presents the LWSs identified within 2 km of the Site[116].

Table 9-4 LWSs located within 2 km of the Site[117]

Designated Site	Approximate Location
Leadbrook Wood LWS; the Lead Brook watercourse flows north through Leadbrook Wood LWS before its confluence with the River Dee	Located approximately 100 m south of the Site
Llwyn-onn LWS	Located approximately 500 m west of the Site
Top-y-fron Dingle and Kelserton Brook LWS	Located approximately 800 m south-east of the Site
Cheshire Farm LWS	Located approximately 1.5 km south of the Site

[116] The Site referenced here, in relation to the Aspect Ecology Report, is based on a previous version of the Site Boundary, which has subsequently been updated. Refer to Site Location Plan 6322/ECO1 within those reports.
[117] The Site referenced here, in relation to the Aspect Ecology Report, is based on a previous version of the Site Boundary, which has subsequently been updated. Refer to Site Location Plan 6322/ECO1 within those reports.

9.4.10 As part of the ecological desk study, the presence of all relevant non-statutory designated sites will be determined as presented within the PEIR.

9.4.11 Other ecologically sensitive habitat sites including The Deeside Naturalists' Society Reserve and RSPB reserves within the study area will be identified through the ecological desk study and assessed within the EcIA.

Habitat Desk Study

Ancient Woodland

9.4.12 The desk study identified approximately 20 areas of ancient woodland located within 2 km of the Site. None of the ancient woodland sites identified in the desk study are located within the Site. The nearest is an area of ancient semi-natural woodland located approximately 40 m south-west of the Proposed CO_2 Connection Corridor.

9.4.13 Refer to **Figure 9-3 (Appendix A)** for the location of recorded ancient woodland.

Priority Habitats

9.4.14 From a review of MAGIC and baseline data carried out by Aspect Ecology in August 2021, there are two Habitats of Principal Importance (HoPI): saltmarsh and coastal and floodplain grazing marsh (both UK priority habitat) which are present within and adjacent to the Main Site, Water Connection Corridor, Electrical Connection Corridor and Indicative Enhancement Area.

9.4.15 Refer to **Figure 9-3 (Appendix A)** for the location of priority habitats.

9.4.16 The desk study review of aerial imagery also identified hedgerows, currently assumed to be native and potentially species-rich, within the Repurposed CO_2 Connection Corridor and the Proposed CO_2 Connection Corridor.

Freshwater Habitats

9.4.17 Two freshwater habitats are located within the Site. These include the SAC features: *Salicornia* and other annuals colonising mud and sand which support pioneer low marsh communities, and Atlantic salt meadows which support low to mid marsh communities. OS maps show a series of waterbodies above MHWS within these habitat areas.

Habitat Field Survey

9.4.18 Habitat surveys are proposed at all locations where permanent infrastructure may be constructed for the Proposed Development (i.e. the Main Site, which includes the proposed generating station; the Water Connection Corridor, for the construction and operation of potentially new intake and outfall infrastructure; and the Proposed CO_2 Connection Corridor). Habitat surveys are also proposed for areas where temporary land take/ habitat disturbance is required to facilitate the Proposed Development (e.g. temporary construction laydown areas within the Main Site) and the Indicative Enhancement Area, for potential mitigation and biodiversity enhancement measures. Data will also be collected for a 50 m study area around the Site (subject to access). The scope of the planned habitat surveys is set out in **Table 9-5**.

9.4.19 A habitat walkover survey was carried out in November 2023 of the Site, specifically the Main Site and Indicative Enhancement Area, plus 50 m (where access allowed). The purpose of the survey was to ground-truth previous habitat survey information gathered by Aspect Ecology in 2021 and 2023.

9.4.20 An area of possible Open Mosaic Habitat (OMH) on previously developed land (UK priority habitat) was identified during the habitat walkover survey within the Site, specifically the Indicative Enhancement Area.

9.4.21 The habitats present within the Site and adjacent land up to 50 m (subject to access) including any HoPI will be confirmed through an updated habitat walkover survey at an optimal time of year (e.g. April to September). This survey will be carried out with reference to UK Habitat (UKHab) Classification[118] and the CIEEM PEA Guidance. Hedgerows within the Site would be surveyed against the landscape and wildlife important hedgerow criteria of the Hedgerow Regulations 1997. The UKHab Classification will also be used for the purposes of assessing habitat condition, to support the NBB assessment, with reference to the current iteration of the standard methodology[119] (currently this is the statutory biodiversity metric for England (see the Statutory Biodiversity Metric Guidance), and which is proposed to be used for this assessment in the absence of other guidance).

Protected and Notable Species

9.4.22 It is anticipated that some habitat within the ZoI of the Site will have suitability to support protected and notable species including wintering and breeding birds, bats, badger *Meles meles*, otter *Lutra lutra*, great crested newt *Triturus cristatus*, terrestrial invertebrates, plants, fish, macroinvertebrates, marine mammals and potentially natterjack toad.

9.4.23 Notable freshwater or migratory species cited as qualifying features for selection within the Dee Estuary / Aber Dyfrdwy SAC and The River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC include sea lamprey, river lamprey Petalwort and bullhead. European eel records from NBN atlas are present within the River Dee, approximately 8 km upstream from the Site. Additional records are found in Nant Gwepra, where its confluence with the River Dee is located 1.5 km upstream of the Site. Migratory species are assessed further in **Chapter 10: Marine Ecology**.

9.4.24 While desk study data is available for some species (refer to **Preliminary Ecological Appraisal, Appendix B**), the data coverage is partial and there are limitations in the data regarding whether these species are likely to occur in relation to the Site. To address data gaps, a suite of species surveys is proposed as outlined in **Table 9-5**. The survey methodologies will follow Natural Resource Wales Standing Advice[120] (where available) and /or Natural England Standing Advice[121], CIEEM Guidelines, and industry guidance for protected species survey.

[118] UKHab Ltd, 2023; *UK Habitat Classification Version 2.0* [online]. Available at: https://www.ukhab.org.
[119] Natural England, 2023; *The Biodiversity Metric 4.0 (JP039)* [online]. Available at: The Biodiversity Metric 4–0 - JP039 (naturalengland.org.uk)
[120] Welsh Government, 2023: *Wildlife and habitat conservation, Guidance and services* [online]. Available at: https://www.gov.wales/wildlife-habitat-conservation
[121] UK Government, 2023; *Guidance: Protected species and development: advice for local planning authorities* [online]. Available at: Protected species and development: advice for local planning authoriti–s - GOV.UK (www.gov.uk)

9.4.25 Reptile surveys conducted by Aspect Ecology in 2022 determined that a low population of common lizard *Zootoca vivipara* were present within the Site i.e., within the Indicative Enhancement Area. Surveys in the Main Site found reptiles to be absent. The habitats suitable for reptiles present within the Site were found to be largely unchanged since the initial reptile surveys conducted by Aspect in 2022 and there is potential for small numbers of common reptiles to be present within the Site within areas of less managed habitat. No further reptile surveys are proposed (refer to **Appendix B**).

9.4.26 Hazel dormouse *Muscardinus avellanarius* were initially scoped out as a protected species constraint. The walkover in November 2023 reaffirmed the findings from the Aspect Ecology Phase 1 Habitat and Faunal survey in August 2021 and April 2023. The habitats present within the Site provide limited opportunities for hazel dormouse, as although the habitats contain young plantation woodland and scrub, they lack the structure and preferred species, such as hazel *Corylus avellana* and honeysuckle *Lonicera periclymenum*. The Site also lacks connectivity with offsite habitats; isolated by the River Dee to the north and east, and development to the west and south. The lack of connectivity and limited suitability indicate that dormouse is likely absent from the Site. This will be reaffirmed via the desk study with the third-party Local Biodiversity Record Centre (i.e., North Wales Environmental Information Service (Cofnod)) and the results reported in the PEIR.

Table 9-5 Summary of Ecological Surveys and Data Collection (Including Ornithology and Aquatic Ecology)

Survey	Scope	Survey Timing	Survey Extents
Preliminary Ecological Appraisal (PEA) including UKHab survey and habitat condition assessment to inform NBB	A PEA including UKHab survey and habitat condition assessment will be carried out during the optimal survey season based on the following methodology: UKHab Classification, Statutory Biodiversity Metric, and CIEEM PEA Guidance. Hedgerows within the Site would be surveyed against the landscape and wildlife important hedgerow criteria of the Hedgerow Regulations 1997. The survey will also reaffirm the potential habitats to support protected and/or notable fauna, including protected species, Species of Principal Importance (SOPI) and Local Biodiversity Action Plan species, specifically in association with the Proposed CO_2 Connection Corridor.	April to September 2024	Accessible terrestrial habitats within the Site plus up to 50 m (where accessible).
Botanical survey including National Vegetation Classification (NVC) surveys	Detailed NVC of the saltmarsh and sparsely vegetated urban land (potential OMH), will be completed in accordance with Rodwell (2006)[122].	May to July 2024	Accessible terrestrial habitats within the Site, specifically the Main Site, Water Connection Corridor, and Indicative Enhancement Area. Further surveys in association with the Proposed CO_2 Connection Corridor are to be confirmed following the PEA.
Wetland bird surveys	Year-round waterbird surveys over a 12-month period with a minimum of three visits per month, following modified Wetland Bird (WeBS) methodology[123] utilising point and sector counts across various tidal states. The surveys will be	November 2023 to October 2024	All land within the Site (specifically, the Main Site including the Water Connection Corridor, Proposed CO_2 Connection Corridor, and Indicative Enhancement Area) and study area

[122] Rodwell, J.S., 2006; *National Vegetation Classification User's Handbook*. Peterborough: JNCC.
[123] British Trust for Ornithology, 2023; Wetland Bird Survey. Available at: https://www.bto.org/our-science/projects/wetland-bird-survey

Survey	Scope	Survey Timing	Survey Extents
	timed to take place at the appropriate high and low water periods to cover the spring neap tides. Each month these survey visits would include a nocturnal survey visit. The survey techniques in each month would comprise a combination of walked transects and monitoring of key habitats, including the use of spotting scopes and thermal imaging cameras to record birds at night.		of estuary and saltmarsh habitats up to 1.5 km (as visibility allows).
Breeding bird surveys	CBC methodology[124] of all terrestrial parts of the Site and surrounding saltmarsh habitats. The survey will comprise five monthly visits March to July, inclusive. The survey in each month would comprise a walked transect. An additional four visits in April to June will also be conducted to identify the presence of any breeding wader species within the Site or intertidal habitats. These are target surveys, in addition to the wetland surveys, to monitor the most suitable habitats for waders in these locations. Approximate bird territories will be extrapolated from the survey data in accordance with the territory mapping methods based on Gilbert et al. (1998)[125].	March 2024 to July 2024 (one visit per month for five months); and April 2024 to June 2024 (an additional four visits)	All land within the Site (specifically, the Main Site including the Water Connection Corridor, Proposed CO_2 Connection Corridor, and Indicative Enhancement Area) and study area of estuary and saltmarsh habitats up to 1.5 km (as visibility allows).
Great crested newt habitat suitability assessments including environmental DNA	A great crested newt habitat suitability index (HSI) will be completed at ponds on and within 500 m of the Site (where applicable). The HSI assessment will evaluate the suitability of accessible ponds for great crested newt based	15th April to end of June 2024	Ponds within the Site (Main Site including Water connection Corridor, Proposed CO_2 Connection Corridor, and Indicative Enhancement Area) plus up to 500 m where applicable.

[124] Marchant, J. H, 1983; *Common Birds Census instructions*. Tring: British Trust for Ornithology.
[125] Gilbert, G., Gibbon, D. W. and Evans, J.,1998; *Bird Monitoring Methods – a manual of techniques for key UK species*. Sandy: RSPB.

Survey	Scope	Survey Timing	Survey Extents
	on methodology of Oldham et al (2000) [126]. Water samples will also be taken from accessible ponds in accordance with the method of Biggs et al (2014)[127] and analysed for great crested newt environmental DNA (eDNA) at a laboratory approved by Natural Resource Wales. Further great crested newt population size class assessment survey may be required, depending on the results of the eDNA survey.		
Potentially natterjack surveys	Natterjack toads were introduced along the Dee Estuary through the Natterjack Reintroduction Project. Saltmarsh habitat within the Site may potentially offer opportunities for natterjack toads, particularly any shallow pools of water and coastal habitat. Scope and requirement for surveys is to be confirmed upon review of third-party desk study data and potential impacts to suitable habitat.	April to September[128]	If required, potentially ponds and salt marsh habitat within the Site, specifically the Main Site including Water Connection Corridor, and Indicative Ecological Enhancement Area.
Bats – Preliminary Roost Assessment (PRA)	Some buildings within the Site, specifically the Main Site comprising the GTP and Contractor Facilities are potentially proposed to be demolished, which may offer potential suitability to support roosting bats. Additionally, buildings to be retained may have potential for roosting bats and be indirectly impacted by the Proposed Development, for example the AGI. Trees with within the Indicative Enhancement Area and along the access road to the power	Any time of year	PRA of buildings and trees within the Site and up to 50 m, specifically the Main Site, Indicative Enhancement Area and *potentially* the Proposed CO_2 Connection Corridor.

[126] Oldham, R.S. & Keeble, J. & Swan, M.J.S. & Jeffcote, M., 2000; Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal*. 10. 143-155
[127] Biggs et. al, 2014; *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA*. Oxford: Freshwater Habitats Trust.
[128] Martin, Y et., al; 2021: *Guidance for monitoring natterjack toad populations in the United Kingdom. Natterjack Toad Species Recovery Programme* [online]. Amphibian and Reptile Conservation. Available at: https://www.arc-trust.org/Handlers/Download.ashx?IDMF=e9980a11-c175-42f1-8374-df06f5de97d2

Survey	Scope	Survey Timing	Survey Extents
	station have potential suitability to support roosting bats. A detailed daytime bat walkover will be carried out of the Site, comprising a PRA. The methodology will follow the Bat Conservation Trust (BCT) Good Practice Guidelines[129]. Further bat roost presence / absence surveys and hibernation to be confirmed following the PRA.		
Bats – Foraging and Commuting	The habitats within the Site, specifically the Main Site including Water Connection Corridor, Indicative Enhancement Area, and potentially the Proposed CO_2 Connection Corridor (to be confirmed) are assessed as moderate suitability for foraging and commuting bats e.g., grassland, scrub, woodland, wetland habitats and hedgerows. A night-time walkover will be carried out based upon BCT Good Practice Guidelines. This comprises one survey visit per season (spring – April/May; summer – June/July/August; autumn – September/October). Additionally, automated / static bat detector surveys will be carried out, with data to be collected for a minimum of five consecutive nights per month (April to October) in appropriate (or the best available) weather conditions for bats. Detector locations would aim to provide a representative sample of all habitats in the Site that could be impacted by construction or operation activities.	April to October 2024	A night-time walkover of the Site to include walked transects three times per active season augmented with use of static detectors recording for five nights per season, specifically the Main Site including Water Connection Corridor, Indicative Enhancement Area, and *potentially* the Proposed CO_2 Connection Corridor (to be confirmed). Targeted habitats would be identified for the automated / static detector locations within the Site based on a representative sample of those habitats to be impacted (directly or indirectly) by construction or operation.

[129] Bat Conservation Trust, 2023; *Bat Surveys for Professional Ecologists Good Practice Guidelines*. 4th edition. London: The Bat Conservation Trust.

Survey	Scope	Survey Timing	Survey Extents
Badger	A badger survey will be carried out of the Site plus adjacent areas (where possible). Habitats found within the Site were identified as suitable for foraging and sett building specifically the woodland, scrub, grassland and tall ruderal habitat. Survey methodology will follow best practice guidelines (Harris et al. 1989[130]; and Badger Trust, 2023[131]).	Anytime of year	The Site (excluding the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor), plus up to 30 m (where accessible).
Otter	Otter survey of the Site and adjacent areas, with potential suitable terrestrial habitat to support otter e.g., the River Dee. The otter survey will be completed in accordance with best practice guidance (Chanin, 2023[132], Ward 1994[133], and Lenton et al, 1980[134]).	Anytime of year	The Site, focused on the River Dee and adjacent habitat within the Site, extending up to 200 m up and downstream (where applicable).
Water Vole	Water vole survey of the Site and adjacent areas, with potential suitable habitat to support otter and water vole e.g., ponds within the Site. The water vole survey will be completed in accordance with best practice guidance (Dean et al, 2016[135]).	Mid-April to end of June 2024 (survey one) July to end of September 2024 (survey two)	The Site, focused on the waterbodies within the Site.
Terrestrial invertebrates	Terrestrial invertebrate survey scope is to be confirmed following review of third-party data and scoping walkover by an entomologist. Targeted on habitats suitable for terrestrial invertebrates including OMH.	April - September	The Site (excluding the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor).

[130] Harris, S. Cresswell, P. and Jefferies, D., 1989; *Surveying Badgers*. London: The Mammal Society.
[131] Badger Trust, 2023; *Badger Protection: Best Practice Guidance for Developers, Ecologists and Planners (Wales).* Brighton: Badger Trust.
[132] Chanin, P., 2003; *Monitoring the Otter. Conserving Natura 2000 Rivers. Monitoring Series No. 10*. Peterborough: English Nature.
[133] Ward D, Holmes N and José P, 1994; *The New Rivers and Wildlife Handbook*. Bedfordshire: RSPB.
[134] Lenton, E.J., Chanin, P.R.F. and Jefferies, D.J., 1980; *Otter Survey of England 1977-79*. London: Nature Conservancy Council.
[135] Dean, M. Strachan, R. Gow, D. Andrews, R., 2016; *The Water Vole Mitigation Handbook (The Mammal Society Guidance Series)*. Eds Fiona Mathews and Paul Chanin. London: The Mammal Society.

Survey	Scope	Survey Timing	Survey Extents
Aquatic Surveys	Aquatic walkover surveys within the Site and Pond PSYM[136] surveys of water bodies above MHWS will be required to identify aquatic plants and macroinvertebrates and Priority Ponds, or notable estuarine habitats if present. Aquatic plant Invasive Non-Native Species (INNS) will also be assessed. The requirement for fish eDNA survey of waterbodies will be confirmed following the walkover survey. Survey to support NBB including a Modular River Physical (MoRPh) Survey will be required of Lead Brook. Further surveys of Lead Brook are unlikely to be required as it will remain unaffected by the Proposed Development.	Walkover and MoRPh surveys (March-April 2024); and Pond PSYM (June–August 2024)	The Site, focused on the River Dee and waterbodies within the Site.

[136] Pond Action [now Pond Conservation] (2002). *PSYM Manual; A guide to monitoring the ecological quality of ponds and canals using PSYM* [online]. Available at: https://freshwaterhabitats.org.uk/advice-resources/survey-methods-hub/psym/

Invasive Non-Native Species (INNS)

9.4.27 Checks will be made for INNS during the habitat surveys and during the aquatic ecology surveys. Findings will be presented in the subsequent reports for consideration in the EcIA.

Ornithology

9.4.28 The statutory designated sites relevant to ornithology are summarised in Section 9.4.6.

9.4.29 The Dee Estuary SPA, SSSI and Ramsar sites coincide partly with the Site and construction works have potential to impact the assemblages of bird species they are designated for.

9.4.30 Preliminary baseline data gathering was carried out by Aspect Ecology, between April 2022 and February 2023, by means of a limited suite of breeding, wintering and passage bird surveys.

9.4.31 Monthly surveys were carried out to support the assessment of breeding bird activity (April to July), passage activity (April, May and July to November) and winter activity (November to February) at the Site[137] and adjacent areas. Wetland bird counts were completed on the dates and tide states as summarised in **Table 9-6** for areas that fall within the Main Site and Indicative Enhancement Area.

Table 9-6 Record of Wetland Bird Count Dates and Tide States 2022/23

Date	Tide state
April 2022	1 High
May 2022	1 Rising / High
June 2022	1 High / Falling
July 2022	1 High / Falling
August 2022	1 Rising / High
September 2022	1 Low
October 2022	1 High / Falling
November 2022	1 High
December 2022	1 Rising / High
January 2023	1 High
February 2023	1 Low

9.4.32 The surveys found the following:

- area within and adjacent to the Main Site:
  - two of the four Annex 1 species relevant to the Dee Estuary SPA/Ramsar site were recorded in notable numbers in the estuary adjacent to the Site. Of the qualifying migratory species, seven were recorded in the estuary in significant numbers: redshank *Tringa totanus*, shelduck *Tadorna tadorna*, teal *Anas crecca*, pintail *Anas*

[137] The Site referenced here, in relation to the Aspect Ecology Report, is based on a previous version of the Site Boundary, which has subsequently been updated. Refer to Site Location Plan 6322/ECO1 within those reports.

acuta, oystercatcher *Haematopus ostralegus*, dunlin *Calidris alpina* and black-tailed godwit *Limosa limosa*. All these species were typically observed as widespread within the estuary, although none were recorded within the area of the Main Site. Teal, pintail and black-tailed godwit were recorded within the Dee Estuary SPA/Ramsar site in notable numbers, all during the autumn;

- the most notable breeding birds observed close to the Main Site were a nesting pair of avocet *Recurvirostra avosetta* (nationally rare, Schedule 1) on the island in the largest water body within the nature reserve. Cetti's warbler *Cettia cetti* (Schedule 1) was also recorded breeding in this area. Other common wetland breeding birds were also recorded as present; and
- species breeding in terrestrial habitats within the Main Site and adjacent areas were common and widespread in a local and national context.

- Indicative Enhancement Area:
  - none of the Annex 1 species relevant to the SPA/Ramsar site were recorded during surveys of the estuary adjacent to the Indicative Enhancement Area. Of the qualifying migratory species, redshank was the only species recorded from the part of the estuary close (within 300 m) to the Indicative Enhancement Area. Shelduck, teal, oystercatcher, curlew and dunlin were all regularly present but at distances of greater than 500 m, and in relatively low numbers. All these species were typically widespread within the estuary using exposed mudflats for foraging and none were recorded within the Indicative Enhancement Area;
  - the area supported limited habitats suitable for wetland species at the time of survey, as reported by Aspect Ecology. Habitat for terrestrial breeding species was limited at the time of survey, with breeding species including low numbers of woodpigeon, wren, dunnock, greenfinch and possibly willow warbler, all red or amber list species that are common and widespread both locally and nationally; and
  - in early 2023, the area was largely cleared of scrub and trees as part of regular maintenance. As a result, limited suitable breeding bird habitat was present within this area at the time of survey, as reported by Aspect Ecology.

9.4.33 An ornithological scoping walkover was conducted in November 2023 across the Site and the immediate surrounding areas. The Site is located predominantly onshore (i.e., within terrestrial habitats), however, some elements, particularly the Water Connection Corridor, are proposed beneath, through or within estuarine and wetland habitats including intertidal habitat dominated by intertidal mudflats that may support foraging or roosting waterbirds.

9.4.34 Habitats within the Site were found during the walkover to support large assemblages of wading birds (see **Appendix B Preliminary Ecological Appraisal**). Further baseline data will be gathered including further surveys as outlined in **Table 9-5**. This includes all of the habitats surveyed previously, plus a wider area that includes habitat along the estuary to the north and south, and additional areas incorporated into the Site Boundary i.e., the

Proposed CO_2 Connection Corridor. Nocturnal surveys will also be carried out in addition to diurnal surveys.

9.4.35 Desk study data information will also be gathered from the Local Biodiversity Records Centre (i.e., North Wales Environmental Information Service (Cofnod)), Wetland Bird Species (Webs) data from the British Trust for Ornithology (BTO) and information from the Deeside Naturalist Society (where available).

9.4.36 Technical engagement / consultation with Natural Resource Wales is also proposed to discuss and agree the scope of ornithological surveys.

Aquatic Ecology

9.4.37 Aquatic INNS will be considered during the aquatic walkover survey of the Site proposed between March and April 2024.

9.4.38 A further desk study utilising Environment Agency Ecology and Fish Data Explorer[138] and/or data requested from NRW and NBN Atlas will also be completed to collate records of aquatic species in the River Dee, Lead Brook, and within 2 km of the Site. This will be combined with additional data requested from local record centres in parallel with the terrestrial ecology assessment.

9.5 Impact Assessment Methodology

9.5.1 The EcIA will be undertaken in accordance with the CIEEM Guidelines and EcIA Guidance with reference to the over-arching impact assessment methodology set out in **Chapter 4: Project Alternatives and EIA Methodology**. An assessment of impacts upon important ecological features will be provided, with greater detail provided depending upon the importance of the feature, where there is potential for significant residual effects or where there is uncertainty in the assessment. A matrix based approach to assessments will not be adopted. Instead, in accordance with the CIEEM methodology, impacts on important ecological features will be reported as either significant or not significant, with any significant effects qualified with reference to an appropriate geographical scale (refer to Section 9.5.4).

9.5.2 CIEEM Guidelines make clear that there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*". This does not mean that efforts would not be made to safeguard wider biodiversity, and requirements in support of this would be considered. National policy documents including Planning Policy Wales emphasise the need to achieve NBB.

9.5.3 The results of the ecological desk study, the habitat and species surveys, and the outcomes of consultation responses will be used to inform the relevant ecological features to be addressed in the EcIA. Those who will be consulted are anticipated to include (but not limited to): NRW, FCC and the Royal Society for the Protection of Birds (RSPB).

[138] Environment Agency, 2022; *Ecology and Fish Data Explorer* [Online]. Available at: https://environment.data.gov.uk/ecology/explorer/.

9.5.4 To support a focused EcIA, there is a need to determine the scale at which the relevant ecological features are of importance. Consistent with the CIEEM Guidelines, the importance of each relevant ecological feature will be defined with reference to the geographical level at which it matters. The frames of reference to be used for this assessment will be:

- International (typically this is within an international context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain features to be more notable (of higher value) in a Welsh context relative to Great Britain as a whole);
- Regional (North Wales);
- County (Flintshire);
- District (Deeside);
- Local (features that do not meet criteria for valuation at a District or higher level, but that have sufficient value at the site level to merit retention or mitigation); and,
- Negligible (common and widespread features that have very low value at the level of the Site, and which do not require retention or mitigation at the relevant location to otherwise maintain a favorable nature conservation status, or to deliver wider relevant biodiversity objectives and can be screened out).

9.5.5 Design and impact avoidance measures will be used to inform the assessment of likely significant effects. Refer to Section 9.6 below.

9.5.6 Significant residual effects will be reported following mitigation or, where measures are embedded in the design, after compensation. Specific compensation measures required to address residual effects will then be identified and the final effect reported. In addition, any ecological enhancements will also be identified.

Ornithology

9.5.7 Ornithology will be included in the EcIA and will assess the potential impacts and effects on relevant bird designations and bird species (hereafter referred to as ‘relevant bird features’) as a result of the Proposed Development. The methodology will follow that described in Section 9.5.1 to 9.5.6.

9.5.8 The results of the ornithological desk study, further bird surveys and outcomes of any consultation responses will be used to inform the EcIA. The assessment will also be informed by the findings of other specialist assessments, including those to be reported in **Chapter 6: Air Quality, Chapter 7: Noise and Vibration, Chapter 10: Marine Ecology** and **Chapter 11: Water Environment and Flood Risk**. The findings of the HRA will also be considered.

Aquatic Ecology

9.5.9 Aquatic ecology will be included in the EcIA and will focus on assessing the impacts and effects of the Site on aquatic species and habitats (hereafter referred to as 'relevant aquatic features').

9.5.10 Aquatic desk study results combined with the proposed aquatic ecology surveys and the consultation responses will be used to inform the EcIA. Findings from other specialist assessments such as those included within **Chapter 10: Marine Ecology** and **Chapter 11: Water Environment and Flood Risk** will also be used to inform the EcIA.

Net Benefit for Biodiversity

9.5.11 The Environment (Wales) Act 2016 states that "*Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions.*" PPW expands on this by stating that *"This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity*".

9.5.12 In Wales, a NBB assessment is requested which, as discussed in CIEEM's Briefing Paper on NBB[139], "*does not utilise a metric. Instead, it puts the emphasis on proactive consideration of biodiversity and wider ecosystem benefits within a placemaking context early in the design process*".

9.5.13 In October 2023, the Welsh Government updated Chapter 6 of Planning Policy Wales with immediate effect, including key changes on NBB and the step-wise approach. NBB is a concept that development should leave biodiversity and the resilience of ecosystems in a significantly better state than before through securing immediate and long-term, measurable and demonstratable benefit, primarily on or immediately adjacent to the Site. The step-wise approach is the means of demonstrating the steps which have been taken towards securing NBB. The Diversity, Extent, Condition, Connections and Adaptability (DECCA) Framework will be taken into account to promote resilience of ecosystems:

- **Diversity** between and within ecosystems;
- **Extent** or scale of ecosystems;
- **Condition** of ecosystems including their structure and functioning;
- **Connections** between and within ecosystems; and
- **Adaptability** of ecosystems including their ability to adapt to, resist and recover from a range of pressures likely to be placed on them through climate change for example.

9.5.14 The Welsh Government has yet to release specific guidance on how NBB assessments should be undertaken. A scoping exercise is proposed to be carried out with the local planning authority (LPA) to develop an understanding of what the LPA expect to see from an NBB assessment and potential mitigation options.

[139] CIEEM, 2022; *Welsh Government's Approach to Net Benefits for Biodiversity and the DECCA Framework in the Terrestrial Planning System*. CIEEM Briefing Paper. September 2022. Available at: https://cieem.net/resource/cieem-briefing-welsh-governments-approach-to-net-benefits-for-biodiversity-and-the-decca-framework/

9.5.15 Despite the mention of NBB not using metrics and instead pursuing a qualitative assessment, it is proposed that a biodiversity metric is used to help guide the assessment. This will involve the collection of habitat condition data to help build an understanding of the current baseline, as well as the analysis of the potential impact of post-intervention scenarios. The purpose of this is to have a proxy understanding of potential impacts, with a view to this informing potential off-site mitigation targets, should this be required. Having an element of quantitative input would provide and support a detailed assessment of both biodiversity impacts and opportunities. A biodiversity metric assessment is therefore to be undertaken for the Site in accordance with standard methodology (currently this is the statutory metric for England and which is proposed to be used for this assessment in the absence of other guidance).

9.5.16 A proactive and creative approach towards facilitating the delivery of biodiversity and ecosystem resilience will be taken.

Habitat Regulations Assessment (HRA)

9.5.17 A HRA will be undertaken to assess whether the Proposed Development is likely to have a significant effect on Habitats Sites (formerly known as European Sites). The need to undertake HRA is implemented in Welsh law by the Habitats Regulations (as amended).

9.5.18 Stage 1 of the HRA process (Test of Likely Significant Effects - ToLSEs) will consider the potential pathways of effect between the Proposed Development and Habitats Sites within 15 km of the Site (on the basis that it is unlikely the Proposed Development will affect sites further afield), and whether there is potential to have a significant adverse effect on the integrity of the Habitats Sites, either alone or in combination with other plans or projects. Information used to support the HRA process will include desk study data and the results of relevant species surveys outlined in **Table 9-5**.

9.5.19 Where there is potential for the Proposed Development to have a significant effect upon the qualifying features of Habitats Sites, the pathway will be taken forward to Stage 2 – Appropriate Assessment (AA). At AA, the measures that will be implemented to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant, will be set out.

9.5.20 The HRA will be prepared in line with PINS Advice Note 10 (Habitats Regulations Assessment)[140] including completion of the necessary matrices. The HRA process will be in line with the EIA process. There would be a 'Test of Likely Significant Effects Report' at the PEIR stage, and this will be updated as necessary for the Application including a report to inform Appropriate Assessment, if required.

9.5.21 The scope of the report to inform the HRA will be determined through consultation with NRW and other key stakeholders. It is recognised that HRA is a multi-stage process and, therefore, the Applicant will continue to consult with NRW as the HRA progresses.

[140] PINS, 2022; *Advice Note 10: Habitats Regulations Assessment* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/

9.6 Embedded Mitigation

9.6.1 These measures will be defined in the ES but will include consideration of options to avoid or minimise impacts to relevant terrestrial, freshwater and marine ecology features or otherwise to achieve legislative compliance (e.g., in relation to dust management or water quality). Measures during construction, including best practice, will be included and implemented through a Framework CEMP which would be provided with the Application, with the commitments included within the final CEMP secured by the DCO, or permitting regimes.

9.6.2 Mitigation measures to be incorporated to avoid, reduce, mitigate or offset any adverse environmental impacts of the Proposed Development are likely to include (but not necessarily be limited to) the following:

- designated sites:
  - avoiding/ minimising the potential for direct and indirect impacts to statutory designated sites including the Dee Estuary SPA, Ramsar, SAC and SSSI; and
  - measures during construction, including best practice, will be included and implemented through a Framework CEMP or permitting regimes.
- protected and notable habitats and species (see also Ornithology and Aquatic Ecology):
  - consideration of routing of proposed connection corridors to utilise existing infrastructure to limit excavations/ construction activities required and therefore minimise the potential for habitat losses and disturbance to sensitive species and habitats;
  - avoiding or minimising impacts to relevant terrestrial and freshwater ecology features or otherwise to achieve legislative compliance (e.g. in relation to dust management or water quality);
  - measures during construction, including best practice, will be included and implemented through the CEMP or permitting regimes;
  - protected species licences where applicable issued from NRW with associated agreed mitigation measures; and
  - avoiding sensitive times for species including the nesting bird season (March to August).
- Ornithology
  - consideration of routing of proposed connection corridors to utilise existing infrastructure to limit the excavations/ construction activities required and therefore habitat losses and disturbance to species and habitats;
  - routing of proposed connection corridors to avoid sensitive habitats and areas of regular bird occurrence such that the potential impacts on relevant ornithological receptors are avoided or reduced as far as reasonably practicable;
  - consideration of the siting of infrastructure to minimise visual disturbance to birds within the Dee estuary and / or use of screening;

  - sensitive timings for particularly noisy or visually intrusive works to minimise impacts on birds using the surrounding saltmarsh habitats (informed by the ongoing bird survey work);
  - implementing measures to deliver compliance with industry good practice and environmental protection legislation during construction, e.g., prevention of surface and ground water pollution, fugitive dust management, and noise prevention or amelioration. These would be implemented through the CEMP or permitting regimes; and
  - planning clearance of habitats suitable for breeding birds during site preparation to be undertaken outside the breeding season (typically March-August inclusive for most species), as far as reasonably practicable.

- Aquatic Ecology
  - consideration of the routing of Proposed CO_2 Connection Corridor to utilise existing infrastructure to limit the excavations/ construction activities required and therefore habitat losses and disturbance to species and/or habitats;
  - routing of the Proposed CO_2 Connection Corridor to avoid sensitive habitats and use of non-intrusive methods of watercourse crossing (e.g., Horizontal Directional Drilling HDD) for the tributary of Pentre Brook /Lead Brook where this is reasonably practicable;
  - retaining and protecting existing water features within the Site as far as reasonably practicable and implementing measures to protect water quality during construction and operation; and
  - consideration of eel screening for the proposed abstraction from the River Dee, as per the requirements of the Eel Regulations 2009 and best practice guidance in relation to water abstraction structures[141].

9.7 Potential Effects

9.7.1 The following potential impacts and their resulting effects on ecology and nature conservation features will be considered within the EcIA for the Proposed Development:

- temporary disturbance impacts and permanent loss and degradation of nature conservation designations and other relevant terrestrial and aquatic habitats (including any identified Functionally Linked Land) within the Site during construction, and within the wider ZoI where potential pathways for impact extend beyond the Site;
- direct and indirect impacts on relevant protected and notable species, e.g., as a result of injury, temporary or permanent lighting, habitat loss or noise and visual disturbance, during construction and operation;
- temporary water quality (sediment run-off, other possible emissions to water) and air quality impacts (dust emissions, emissions from construction traffic movements) on relevant habitats and species during construction; and

[141] Environment Agency (2017). Safe passage for eels. [Online] Available at: https://www.gov.uk/guidance/safe-passage-for-eels

- long-term air and water quality impacts on nature conservation designations and any associated protected and notable species in the vicinity of, or downwind / downstream of, the Site during operation.

9.7.2 The potential impacts and associated effects of decommissioning are assumed to be similar to construction and will be considered in the ES.

9.7.3 Potential likely significant effects scoped in and out of the assessment are summarised in **Table 9-7**.

Ornithology

9.7.4 The potential impacts of the Proposed Development on relevant bird features will include those arising from construction and operation. The following potential impacts and effects will be considered in the ornithological section:

- the effects on birds resulting from temporary impacts and degradation of habitats within the Site during construction, including impacts from sediment run-off to surface waters;
- temporary disturbance of birds, principally through noise, visual, and dust emissions from construction traffic and other construction related activities;
- permanent losses or degradation of habitats used by nesting, roosting, and feeding birds during construction of the Proposed Development;
- disturbance of habitats and protected species (including noise, light and visual impacts) in the vicinity of the Proposed Development during operation; and
- long-term air and water quality impacts on designated habitats of importance for relevant birds in the vicinity of the Site during operation.

9.7.5 The potential impacts and associated effects of decommissioning are assumed to be similar to construction and will be considered in the ES.

Aquatic Ecology

9.7.6 The potential impacts of the Proposed Development on relevant aquatic features will include those arising from construction and operation. The following potential impacts and effects will be considered in the aquatic section:

- the effects on migratory fish resulting from potential impacts to migratory routes within the Site during construction, including impacts from potential watercourse crossings, noise, vibration, and lighting, are assessed in **Chapter 10: Marine Ecology**;
- the Dee Estuary is a designated SAC for sea (*Petromyzon marinus*) and river lamprey (*Lampetra fluviatilis*). Other protected diadromous fish species found here include Atlantic salmon (*Salmo salar*) and European eel (*Anguilla anguilla*). Risks related to entrainment and impingement, and/or disruption to migration routes by the abstraction of water will be considered in the Marine Ecology chapter of the ES; and

- long-term water quality impacts on designated habitats of importance for relevant aquatic species in the vicinity of the Site during operation.

9.8 Additional Mitigation

9.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

9.8.2 Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation development in the Flintshire and North Wales area.

9.9 Summary of Potential Likely Significant Effects

9.9.1 A summary of elements to be scoped into or out of future assessment is provided in **Table 9-7.**

Table 9-7 Summary of the potential likely significant effects to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Terrestrial and Aquatic Ecology			
Construction	Impacts on designated sites and habitats through permanent loss and temporary landtake, including the Dee Estuary SPA, Ramsar, SAC and SSSI and priority habitats including saltmarsh and OMH. Direct mortality and/or injury of protected and notable species (including, birds, reptiles, bats, badger, riparian mammals, great crested newts, aquatic species, fish, terrestrial invertebrates and potentially natterjack toads). Disturbance and degradation on ecological features (designated sites, habitats and species), from changes in water quality, noise and vibration, dust, visual, and lighting. Opportunities for biodiversity mitigation and enhancement within the Indicative Enhancement Area.	Impacts on hazel dormouse (to be confirmed)	Lack of suitable habitat for dormouse.
Operation	Disturbance of ecological features (as identified during construction) during operation, from changes in water quality, air quality and deposition, noise, visual and lighting. Risk of mortality related to entrainment and impingement, and/or disruption to migration routes by the abstraction of water.		
Decommissioning	Disturbance to ecological features is assumed to be similar to construction.		

10. Marine Ecology

10.1 Introduction

10.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on marine ecology, which comprises benthic[142] ecology, coastal and migratory fish and shellfish and marine mammals. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Water Connection Corridor (a small section of the Existing Natural Gas Connection Corridor) within the River Dee.

10.1.2 The works that will be carried out in the Water Connection Corridor section of the Proposed Development will be below the MHWS and will be assessed in this chapter. These works are hereafter referred to as 'in-river construction works'.

10.1.3 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development**, **Chapter 9: Terrestrial and Aquatic Ecology** and **Chapter 14: Physical Processes** of this scoping report.

10.1.4 Within this chapter, marine biodiversity has been defined as those estuarine and marine ecological receptors within the tidal reach of the river, which are relevant to the area below MHWS, with the exception of birds and freshwater species, which are considered in **Chapter 9: Terrestrial and Aquatic Ecology**.

10.2 Legislation, Policy and Guidance

10.2.1 The following legislation is applicable to marine ecological features:

- MCAA 2009, which provides the legal mechanism to help ensure clean, healthy, safe and productive and biological diverse oceans and seas;
- The Habitats Regulations 2017, which transpose the Habitats Directive (92/43/EEC) into UK legislation out to the 12 nautical mile (NM) limit;
- The Marine Strategy Regulations 2010[143], which transpose the Marine Strategy Framework Directive (2008/56/EC) into UK legislation;
- The Ramsar Convention;
- The Wildlife and Countryside Act 1981 (as amended), which includes provisions relating to nature conservation;
- The Water Environment (Water Framework Directive (WFD)) (England and Wales) Regulations 2017, which transposes the EU Water Framework Directive (2000/60/EC)[144] into UK legislation;
- Natural Environment and Rural Communities (NERC) Act 2006, which lists habitats and species of principal importance (HOPI and SOPI) for

[142] Anything associated with or occurring on the bottom of a body of water.
[143] *The Marine Strategy Regulations 2010* (SI 2010/1627). London: HMSO.
[144] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. *Official Journal* L327:1. Luxembourg: Publications Office of the European Union.

the purpose of conservation of biodiversity and requires public authorities to consider what actions can be taken to further the general biodiversity objective for the conservation and enhancement of biodiversity;

- The Environment Act 2021, which sets clear statutory targets for the recovery of the natural world in four priority areas: air quality, biodiversity, water and waste, and includes the introduction of biodiversity net gain (NBB for the purposes of the Proposed Development);
- SAFFA 1975 which relates to the protection of salmon and freshwater fisheries, as well as preventing the obstruction of fish migratory routes;
- The Eels Regulations 2009, which implement Council Regulation (EC) No 1100/2007 (EC) No 1100/2007 establishing measures for the recovery of the stock of European eel including providing for the free passage of eels; and
- Invasive Alien Species (Enforcement and Permitting) Order 2019, which brings EU legislation into UK law, for the implementation of management measures for invasive alien species.

10.2.2 Relevant national policy applicable to marine ecological features includes:

- The NP;
- The WNMP will guide the sustainable development of Wales' marine area by setting out how proposals will be considered by decision-makers;
- PPW sets out the land use planning policies of the Welsh Government;
- UK MPS, which aims to achieve sustainable development in the UK marine area; and
- NPS for energy. The current NPSs considered to be of relevance to the Proposed Development are:
  - The Overarching NPS for Energy (EN-1);
  - the NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
  - the NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4); and
  - the NPS for Electricity Networks Infrastructure (EN-5).

10.2.3 There are also a number of relevant local policies and plans including:

- FCC LDP. Relevant policies include:
  - Policy STR13: Natural and Built Environment, Green Networks and Infrastructure;
  - Policy EN2: Green Infrastructure;
  - Policy EN3: Undeveloped Coast and Dee Estuary Corridor; and
  - Policy EN6: Site of Biodiversity Importance.
- FCC Biodiversity Plan '*Supporting Nature in Flintshire 2020-2023*'; and
- HRA to Inform the assessment of the FCC LDP.

10.2.4 Relevant guidance to be considered includes:

- CIEEM Guidelines for Ecological Impact Assessment in Britain and Ireland – Terrestrial, Freshwater, Coastal and Marine[145] (CIEEM Marine EcIA Guidelines); and
- The PINS Advice Note 10.

10.3 Assumptions, Limitation and Uncertainties

10.3.1 No specific limitations have been identified for the available marine baseline data.

10.3.2 There are currently uncertainties around the works proposed and construction methodology to be undertaken within the Water Connection Corridor. The Water Connection Corridor shown on **Figure 1-3 (Appendix A)** covers the maximum area that may be required for the construction and operation of existing and potentially new infrastructure for cooling water and will be further refined as the design and EIA studies progress.

10.4 Baseline Conditions

10.4.1 The Proposed Development Site is located approximately 0.6 km north-west of Connah's Quay in Flintshire, north-east Wales (**Figure 1-1, Appendix A**). The Water Connection Corridor of the Proposed Development Site is located partially within the River Dee.

10.4.2 The existing CCGT requires both abstraction of cooling water and discharge into the River Dee. Cooling water is discharged at a rate and with a chemical water quality compliant with the discharge limits set by NRW within the Environmental Permit, considering BAT for those discharges. This means that existing abstraction for the wider Connah's Quay Power Station is limited to no more than three hours around high tide (from one hour prior to high tide until two hours after high tide) and only when the water level is higher than 0.8 m. The cooling water discharge is limited to no more than three hours on the ebb tide (from one hour to four hours after predicted high tide) under the conditions of the existing Environmental Permit.

10.4.3 The existing CCGT cooling water abstraction and discharge infrastructure within the Water Connection Corridor may be reused for the Proposed Development. Alternatively, new cooling water infrastructure may be required. The Water Connection Corridor covers the area required for the potential construction and operation of a new intake and outfall infrastructure, if required.

10.4.4 The existing intake includes eel screens which will need replacing if the abstraction infrastructure is reused. If new cooling water infrastructure is built, appropriate eel screens will be required. In both cases the eel screens will be required to meet current legislative requirements including the Eels Regulations. The requirement to upgrade or replace eel screens to meet current legislative requirements including the Eels Regulations is assessed in **Chapter 9: Terrestrial and Aquatic Ecology**.

[145] CIEEM, 2018, and updated September 2019; *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1*. Winchester: Chartered Institute of Ecology and Environmental Management.

Sources of Information

10.4.5 No specific marine ecological surveys have been carried out to date for the Proposed Development. Therefore, a review of desktop data has been undertaken to inform this baseline section. The desktop data sources used included:

- MAGIC - information on marine, coastal and estuarine habitats and species and designated site information;
- JNCC – reasons for designation and other relevant information;
- Data Map Wales – information on non-statutory designated sites;
- Natural England (NE) & Countryside Council for Wales (CCW) – relevant information on marine designated features of the Dee Estuary designated sites[146];
- Habitat mapping undertaken by the JNCC[147]– Marine Nature Conservation Review (MNCR) area summaries and the Environment Agency saltmarsh zonation and extent in England[148];
- Shellfish classification zones of England and Wales provided by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS)[149];
- SCANS (Small Cetacean Abundance in the European Atlantic and North Sea) data[150];
- Inter-Agency Marine Mammal Working Group (IAMMWG) publications[151];
- Sea Mammal Research Unit (SMRU) and Special Committee on Seals (SCOS)[152];
- International Council for the Exploration of the Sea (ICES) publications and data[153];
- Marine Life Information Network (MarLIN) – habitat and species sensitivity assessments, where available[154];

[146] NE & CCW, 2010; *The Dee Estuary European Marine Site: Dee Estuary / Aber Dyfrdwy Special Area of Conservation, The Dee Estuary Special Protection Area, The Dee Estuary Ramsar Site. Advice given under Regulation 33(2) of the Conservation Regulations 1994*.
[147] Joint Nature Conservation Committee (JNCC), 2019; *Marine habitat data product: UKSeaMap* [Online]. Availa ble: ht tps://jncc.gov.uk/our-work/marine-habitat-data-product-ukseamap/
[148] Environment Agency, 2022; The extent and zonation of saltmarsh in England 2016 – 2019 [Online]. Available at: https://www.gov.uk/government/publications/the-extent-and-zonation-of-saltmarsh-in-england-2016-2019.
[149] Centre for Environment, Fisheries and Aquaculture Science (CEFAS) (2022). Shellfish Classification Zone Maps [Online] Available at: https://www.cefas.co.uk/data-and-publications/shellfish-classification-and-microbiological-monitoring/england-and-wales/classification-zone-maps/.
[150] Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M., Teilmann, J., Vingada, J. and Øien, N., 2021; *Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. 40 pp.* [Online] Available at: https://synergy.st-andrews.ac.uk/scans3/files/2017/05/SCANS-III-design-based-estimates-2017-05-12-final-revised.pdf.
[151] The Inter-Agency Marine Mammal Working Group (IAMMWG), 2023; *Review of Management Unit boundaries for cetaceans in UK waters. JNCC Report 734*. Peterborough: JNCC. ISSN 0963-8091. [Online] Available at: https://hub.jncc.gov.uk/assets/b48b8332-349f-4358-b080-b4506384f4f7
[152] St Andrews University, 2023; *Sea Mammal Research Unit – Special Committee on Seals* [online]. Available at: https://biology.st-andrews.ac.uk/smru/scos/ (Accessed 20/12/2023).
[153] ICES, 2023; *Ecosystem Overview. Celtic Seas ecoregion description*. [Online] Available at: https://www.ices.dk/advice/ESD/Pages/Celtic-Seas_description.aspx
[154] MarLIN, 2023; *Sensitivity assessment* [online]. Available at: https://www.marlin.ac.uk/sensitivity/sensitivity_rationale

- Environment Agency – information of fish counts (TraC data)[155] and marine abundance invertebrate data[156] where available[157];
- Environment Agency – The extent and zonation of saltmarsh in England;
- Environment Agency – (Benthic) Ecology and Fish Data Explorer data; and
- Environment Agency – Salmonid and fisheries statistics for England and Wales[158].

Study Area

10.4.6 The study area is considered based on the greatest likely 'Zone of Influence' (ZoI) for the Proposed Development which is the area over which marine ecology and nature conservation features may be impacted from the Proposed Development and associated activities (CIEEM Marine EcIA Guidelines). The study area for baseline data gathering has been defined on a precautionary basis to obtain sufficient data to determine the ZoI for the purpose of the ecological impact assessment (EcIA). A stratified approach was taken during the desk study, based on the likely ZoI of the Proposed Development on different marine ecological features.

10.4.7 The study area for marine ecology consists of the River Dee (below MHWS) and Dee Estuary. However, further consideration has been given to the Irish Sea for receptors with larger extents and / or greater mobility, such as migratory fish and marine mammals. Further detail on transboundary effects is presented in **Chapter 22: Aspects to be Scoped Out**.

Designated Sites

10.4.8 There are four nature conservation designations (e.g. SAC and SPA, SSSI and Ramsar sites) with relevant marine / estuarine receptors within the study area of the Proposed Development (**Appendix A, Figure 9-1**). These designated sites are listed in **Table 10-1**.

Table 10-1. Relevant Designated Sites

Site Name	Country Designation	Relevant Reason(s) for Designation[159]	Distance from the Site
The Dee Estuary (Aber Dyfrdwy) SAC / Ramsar site / SSSI	Wales and England	**Primary Qualifying Coastal Features** Annex I habitats • 1140 Mudflats and sandflats not covered by seawater at low tide • 1310 Salicornia and other annuals colonising mud and sand	Within the Water Connection Corridor

[155] Environment Agency, 2019; *TraC Fish Counts for all Species for all Estuaries and all years* [Online]. Available at: https://www.data.gov.uk/dataset/41308817-191b-459d-aa39-788f74c76623/trac-fish-counts-for-all-species-for-all-estuaries-and-all-years
[156] Environment Agency, 2020; *Marine Benthic Invertebrate Species*. [Online] Available at: https://environment.data.gov.uk/portalstg/home/item.html?id=cf1bb55e9a5f4916aea8eb9df752506e
[157] No Environment Agency fish sampling stations were located within the River Dee and therefore no information on fish counts were available.
[158] Environment Agency, 2022; *Salmonid and fisheries statistics for England and Wales* [Online]. Available from: https://www.gov.uk/government/publications/salmonid-and-freshwater-fisheries-statistics-2021/salmonid-and-fisheries-statistics-for-england-and-wales-2021#:~:text=These%20are%20the%20rod%20statistics,compared%20with%202020%20(11%2C566.
[159] Only marine and estuarine qualifying features are considered in this chapter.

Site Name	Country Designation	Relevant Reason(s) for Designation[159]	Distance from the Site
		• 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) **Additional Qualifying Coastal Features** Annex I habitats • 1130 Estuaries • 1210 Annual vegetation of drift lines • 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts • 2110 Embryonic shifting dunes • 2120 "Shifting dunes along the shoreline with *Ammophila arenaria* (""white dunes"")" • 2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")"* Priority feature • 2190 Humid dune slacks Annex II species • Sea lamprey *Petromyzon marinus* • River lamprey *Lampetra fluviatilis*	
River Dee and Bala Lake SAC	Wales	**Additional Qualifying Features** Annex II species • Atlantic salmon *Salmo salar* • Sea lamprey • River lamprey • Brook lamprey *Lampetra planeri*	Located adjacent to the Water Connection Corridor
River Dee (Aber Dyfrdwy) SSSI	Wales	Annex II species • Atlantic salmon • Brook lamprey • Brown trout *Salmo trutta*	Approximately 0.1 km upstream of the Water Connection Corridor

10.4.9 The nearest Marine Conservation Zone (MCZ) is the Fylde MCZ, which is located over 50 km away. This site is designated for benthic habitats (sand and mud).

Benthic Ecology

Estuarine Habitats

10.4.10 The Water Connection Corridor of the Proposed Development is situated within the Dee Estuary. The Dee Estuary comprises **Annex I** habitats which are listed in **Table 10-1**. The Water Connection Corridor is dominated by intertidal mudflats and saltmarsh with smaller areas of subtidal mixed sediment and intertidal rock. These habitats, which also extend beyond the Site into the wider Dee Estuary area, are described in further detail below.

10.4.11 The Dee Estuary SAC Marine Habitat Features Map identifies the following **Annex I** SAC habitats within the Water Connection Corridor:

- **Annex I 1140** Mudflats and sandflats not covered by seawater at low tide:

  - Mud communities; and
  - Muddy sand communities including cockle beds.
- **Annex I 1330** Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*):
  - Low to mid marsh communities; and
  - Mid to upper marsh communities.
- **Annex I 1310** *Salicornia* and other annuals colonising mud and sand:
  - Possible pioneer low marsh communities; and
  - Pioneer low marsh communities.
- Other estuarine communities:
  - Subtidal sediment communities.

10.4.12 On the basis of Phase I Intertidal Surveys undertaken in 2005[160], the following specific estuarine habitats are located within the Water Connection Corridor:

- **A1** - Intertidal rock - **A1.451** - *Enteromorpha spp*. on freshwater-influenced and/or unstable upper eulittoral rock
- **A2.2** - Intertidal sand and muddy sand - **A2.241** - *Macoma balthica* and Arenicola marina in muddy sand shores (included in **Annex I** 1140)
- **A2.3** – Intertidal mud - **A2.313** *Hediste diversicolor, Macoma balthica* and *Scrobicularia plana* in littoral sandy mud (included in **Annex I** 1140)
- **A2.4** - Intertidal mixed sediments - **A2.43** - Species-poor mixed sediment shores (included in **Annex I** 1140)

10.4.13 Beyond the Water Connection Corridor, extensive areas of intertidal mudflats and saltmarshes are located downstream of the Dee Estuary. These SAC habitats, located outside of the Proposed Development Site, mainly comprise **Annex I 1330** Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) with some areas of **Annex I 1140** Mudflats and sandflats not covered by seawater at low tide and **Annex I 1310** *Salicornia* and other annuals colonising mud and sand. This matches the European Nature Information System (EUNIS) classification[161] of habitats located downstream which were recorded to comprise mainly **A2.3** – Intertidal mud and **A2.2** - Intertidal sand and muddy sand.

Benthic Invertebrates

10.4.14 The mid-upper section of the Dee Estuary, where the Water Connection Corridor is located, consists of fine muddy sand, dominated by ragworm *Hediste diversicolor* and the Baltic tellin bivalve mollusc *Macoma balthica*. Other benthic invertebrates found within the Dee Estuary include the bivalves *Cerastoderma edule*, *Macoma balthica* and *Mya arenaria* and the lugworm *Arenicola marina*, which are typically found in muddy sand shores. Common heart urchin *Echinocardium cordatum*, peppery furrow shell *Scrobicularia* plana, Ensis sp. and polychaete worms such as *Eteone longa*

[160] NBN Atlas, 2017; *Marine Intertidal Phase 1 Species Dataset from the Countryside Council for Wales 1996-2005* [online]. Available at: https://registry.nbnatlas.org/public/show/dr1340
[161] European Environment Agency, 2012; *EUNIS habitat classification* [Online]. Available at:: https://eunis.eea.europa.eu/index.jsp.

are also typically found in lower shore or shallow sublittoral muddy fine sand. Slightly higher up the shore the sediments are more often dominated by amphipods *Bathyporeia pilosa* and *Corophium arenarium*.

10.4.15 Marine benthic invertebrate surveys were most recently carried out by the Environment Agency[162] in the Dee Estuary in 2015. The surveys included ten sample sites. The closest sampling site is station #11 which is located approximately 7.5 km downstream of the Site. The surveys collected information regarding the presence and abundance of benthic invertebrate species. The survey findings at these locations were analysed to determine benthic composition within the Dee Estuary. The overall benthic composition across all ten locations comprised 31% molluscs, 25% nematodes, 23% annelids (polychaetes and oligochaetes), 19% crustaceans, and 1% Nemertea, with an overall relatively good species diversity and abundance. Across the sampling sites, the most commonly occurring taxa were Nematoda, *Peringia ulvae*, *Corophium volutator* and *Pygospio elegans.* The benthic species composition is likely similar within the Water Connection Corridor; however, it may have a higher freshwater benthic composition given the Site is located further upstream.

10.4.16 These invertebrates provide an abundant food source for fish and are of particular importance for waterbirds, with over 120,000 birds visiting the estuary during the winter months.

Migratory Fish

10.4.17 The Dee Estuary and River Dee is an important breeding, sheltering and nursery area for many coastal fish species. It supports a number of migratory fish species including Atlantic salmon *Salmo salmar*, brown trout *Salmo trutta*, river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus*, European eel *Anguilla Anguilla*, twaite shad *Alosa fallax* and smelt *Osmerus eperlanus*. These migratory species are all listed as Species of Principal Importance (SOPI) under the Natural Environment and Rural Communities (NERC) Act 2006.

10.4.18 The River Dee is of particular interest for Atlantic salmon as it is one of the North Wales' index rivers[163] for this species[164,165]. The Mynach, Meloch and Ceiriog tributaries are the most important Atlantic salmon spawning tributaries in the Dee catchment located several tens of kilometers from the Proposed Development Site.

10.4.19 The Dee Estuary also supports non-migratory fish populations of brook lamprey *Lampetra planeri* and it is also recognised as a European bass *Dicentrarchus labrax* nursery area.

Marine Mammals

10.4.20 The Site is located within the ICES Celtic Sea Ecoregion, which in part forms the boundaries for the IAMMWG marine mammal Management Units (MUs)

[162] Information regarding the presence, and number, of benthic invertebrate species at specific marine monitoring points held within the Environment Agency's database is available online via the Ecology and Fish Data Explorer.
[163] Index rivers are characterised by their intensive and long-term monitoring programs.
[164] Natural England, 2019; *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid Special Area of Conservation* [online]. Available at: https://publications.naturalengland.org.uk/publication/4660149109129216
[165] Natural Resource Wales, 2022; *Dee Stock Assessment Angler Report 2022* [online] Available at: https://cdn.cyfoethnaturiol.cymru/media/696697/dee-angler-report-2022_icd1.pdf?mode=pad&rnd=133277556290000000

for the Celtic Sea. Eighteen species of cetacean[166] have been recorded in Welsh waters since 1990. However, the five most commonly occurring species are harbour porpoise *Phocoena phocoena*, bottlenose dolphin *Tursiops truncatus*, common dolphin *Delphinus delphis,* Rissos dolphin *Grampus griseus* and minke whale *Baleanoptera acutorostrata*[167] .

10.4.21 An additional five species occur regularly in the ecoregion but are less common: white-beaked dolphin *Lagenorhynchus albirostris*, Atlantic white-sided dolphin *Lagenorhynchus acutus*, fin whale *Balaenoptera physalus* long-finned pilot whale *Globicephala melas*, and killer whale *Orcinus orca*. It is considered unlikely that these cetaceans will occur in the River Dee itself, although harbour porpoise and bottlenose dolphin could potentially occur in the surrounding coastal waters, such as in the outer Dee Estuary.

10.4.22 Harbour seal *Phoca vitulina* and grey seal *Halichoerus grypus* are occasionally seen in the River Dee. The closest haul-out site for both of these species is on the West Hoyle sandbank (Hilbre Island) located over 15 km downstream of the Proposed Development in the mouth of the Dee Estuary. Over 800 grey seals have been recorded hauled-out here[168]. Grey seals are the only pinniped species[169] to breed in Wales though this haul-out site is only used for moulting and feeding during the non-breeding season. Harbour seals are also recorded hauled-out on the West Hoyle sandbank; however, exact haul-out numbers of this species are not known. The nearest designated site for pinnipeds is the Pen Llyn a'r Sarnau SAC which is designated for grey seals and is located over 80 km south-west of the Site (in a straight line).

Marine Specific Ecological Surveys and Data Collection

10.4.23 Following a review of available data, intertidal habitat surveys are proposed for the area below MHWS within the Water Connection Corridor section of the Site to include a 500 m buffer either side of the corridor boundary (where accessible). Hereafter, this is referred to as the 'survey area'.

10.4.24 The intertidal zone within the study area (described in paragraphs 10.4.10 to 10.4.13) primarily comprises mud and saltmarsh habitat. The Site is located within the Dee Estuary SAC and is adjacent to the River Dee and Bala Lake SAC. The existing marine survey data is over eight years old; therefore, updated intertidal surveys below MHWS may be required to provide an updated dataset that encompasses the range of habitats and any potentially sensitive, protected and / invasive non-native marine ecology located in proximity to the Site.

10.4.25 No other marine specific surveys are proposed for the Proposed Development. The presence of harbour and grey seals in the study area is well known, including abundance, seasonality, and the known haul-out locations for these species; therefore, no effort-based surveys for marine mammals have been proposed. However, incidental sightings of seals will be

[166] Marine mammals such as dolphins and porpoises.
[167] Baines, M.E. and Evans, P.G.H., 2012; *Atlas of the Marine Mammals of Wales. CCW Monitoring Report No. 68. 2nd edition*. 139pp. Cardiff: CCW.
[168] Westcott, S.M. and Stringell, T.B. (2004). Grey seal distribution and abundance in North Wales, 2002-2003. Cardiff: CCW.
[169] Marine mammals such as seals.

recorded as part of the breeding and non-breeding bird surveys proposed for the Proposed Development (**Chapter 9 – Terrestrial and Aquatic Ecology**).

10.5 Impact Assessment Methodology

Assessment Methodology

10.5.1 The assessment methodology for marine ecology will be completed in accordance with the CIEEM Marine EcIA Guidelines with reference to the over-arching impact assessment methodology set out in **Chapter 4: Project Alternatives and EIA Methodology**. The methodology will be tailored to reflect the conditions of the marine ecological environment, considering the high levels of movement of marine receptors between habitats and populations. A non-matrix-based approach to assessments will be adopted.

10.5.2 Consultation with regulators and stakeholders, including NRW, JNCC, Natural England, FCC, and the Marine Management Organisation (MMO), will take place regarding the need for marine surveys and proposed approach to assessment.

10.5.3 The results of the ecological desk study, the marine intertidal survey, and the outcomes of consultation will inform the relevant marine ecological features to be addressed in the ES.

10.5.4 A HRA will also be carried out as part of the ES and the results of HRA Screening presented for statutory consultation as part of the PEIR. Technical engagement will be undertaken with NRW to agree the approach to this assessment. Refer to **Chapter 9: Terrestrial and Aquatic Ecology.**

10.5.5 Given the distance from the Fylde MCZ and therefore the absence of any plausible pathways for potential project related impacts and effects, the requirement to carry out a MCZ assessment is proposed to be scoped out.

10.6 Embedded Mitigation

10.6.1 The following measures are specifically intended to avoid and / or reduce impacts to marine ecology during the construction and operational phases of the Proposed Development to achieve legislative compliance.

10.6.2 Measures during construction, including good practice, will be included and implemented through the Framework CEMP and Site Waste Management Plan (SWMP) or permitting regimes.

To Avoid and / or Reduce Direct Loss and Physical Disturbance to Marine Ecology

10.6.3 Should the Proposed Development re-use, refurbish or replace the existing outfall located in the Water Connection Corridor, permanent habitat loss will be minimised as far as reasonably practicable.

10.6.4 Project vessels involved in construction activities in-river will adhere to a range of measures to prevent pollution via the marine licence (whether deemed or otherwise) that will be required for construction. This will include the International Maritime Organisation (IMO) International Convention for the Control and Management of Ships' Ballast Water and Sediments with the

aim of preventing the spread of marine invasive non-native species (INNS)[170].

10.6.5 Any project vessels will adhere to the IMO Guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species (the 'Biofouling Guidelines')[171].

10.6.6 Committed eel screen mesh sizes and water intake velocities will be agreed with the NRW (the regulator) and employed to protect eels.

To Avoid and / or Reduce Underwater Sound and Visual Disturbance to Marine Ecology

10.6.7 The standard JNCC mitigation measures for construction piling[172,173] will be adopted during construction of the Proposed Development as appropriate.

10.6.8 Construction and operational lighting will be arranged so that glare and light spill outside the construction site is minimised to avoid impacts to sensitive ecological features, particularly migratory fish.

To Avoid and / or Reduce Potential Effects to Marine Ecology from Changes to Marine Water Quality

Construction Phase

10.6.9 Embedded mitigation measures and best practice techniques related to water quality during construction (e.g. the management of construction site run-off, spillage risk and the dispersion of suspended sediments) is set out in **Chapter 11: Water Environment and Flood Risk**.

Operational Phase

10.6.10 Embedded mitigation measures and best practice techniques related to water quality during operation (e.g. the dispersion of suspended sediments) are set out in **Chapter 11: Water Environment and Flood Risk**.

10.7 Potential Effects

Construction phase

10.7.1 The following potential impacts and their resulting effects on marine ecology and nature conservation features will be considered within the marine ecology assessment in the ES:

- direct loss and physical disturbance to benthic habitats and species from works carried out below MHWS within the Water Connection Corridor section of the Site;

[170] International Maritime Organisation (IMO), 2017; *International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM)* [online]. Available at: https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx
[171] IMO, 2023; *2023 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species* [online]. Available at: https://www.glofouling.imo.org/_files/ugd/34a7be_0e4b1c553c9d4420b3ccd864ea3609dd.pdf
[172] JNCC, 2010; *Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise*. Peterborough: JNCC.
[173] JNCC, 2017; *JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys (seismic survey guidelines)*. Peterborough: JNCC.

- physical disturbance to benthic habitats and species from increased suspended sediment concentrations (i.e. increased turbidity and deposition) within the ZoI;
- indirect effects to marine ecology from changes in marine water quality (excluding turbidity) within the ZoI;
- underwater sound and vibration disturbance to marine ecology, particularly migratory fish, within the ZoI;
- indirect effects to marine ecology from hydromorphological changes (e.g. changes to water flow or sediment movement) within the ZoI;
- introduction and spread of INNS from any in-river works;
- collisions between any project vessels and marine mammals; and
- indirect effects on commercial fish and shellfish species.

10.7.2 The following potential impacts and their resulting effects on marine ecology and nature conservation features are proposed to be scoped out from further consideration:

- physical disturbance to marine ecology from changes in the airborne soundscape and visual disturbance during construction within the ZoI.

10.7.3 River and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which have the potential to disturb seals that have surfaced or have hauled out. However, the nearest haul-out site for seals is Hilbre Island in the mouth of the Dee Estuary over 15 km downstream of the Site. Due to the intervening distance, there will be no available pathway and therefore no likely significant effect to seals and/or other marine mammals from changes in the airborne soundscape and visual disturbance. This matter is therefore proposed to be scoped out from further assessment.

Operational phase

10.7.4 The following potential impacts and their resulting effects on marine ecology and nature conservation features will be considered within the marine ecology assessment in the ES:

- indirect effects to marine ecology from any changes to existing thermal and chemical effects from treated water discharge (subject to control under an Environmental Permit that will be required for discharges);
- indirect effects to marine ecology from hydromorphological changes (e.g. changes to water flow or sediment movement) within the ZoI;
- physical disturbance and potential mortality to marine ecology from entrainment and impingement within the cooling water abstraction and discharge infrastructure within the Water Connection Corridor;
- temporary increase in suspended sediment concentrations (SSC) sediment deposition from potential maintenance dredging leading to contaminant mobilisation turbidity and smothering effects on subtidal habitats and species;

- effects to intertidal habitats and species (including fish) from the deposition of airborne pollutants (e.g. from emissions from the power plant stacks during operation); and
- changes in the airborne soundscape during operation.

10.7.5 The following potential impacts and their resulting effects on marine ecology and nature conservation features are proposed to be scoped out from further consideration:

- physical disturbance to marine ecology from changes in the underwater sound, and visual disturbance during operational phase.

10.7.6 The operational phase of the Proposed Development will not result in changes to underwater sound, or visual disturbance which will impact marine habitats or species. This matter is therefore proposed to be scoped out from further assessment.

Decommissioning phase

10.7.7 The following potential impacts and their resulting effects on marine ecology and nature conservation features will be considered within the marine ecology assessment in the ES:

- potential impacts and associated effects are assumed to be similar in nature to construction.

10.8 Additional Mitigation

10.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

10.9 Summary of Potential Likely Significant Effects

10.9.1 Potential likely significant effects proposed to be scoped in and out of the assessment are summarised below in **Table 10-2**.

Table 10-2 Summary of the potential likely significant effects to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Marine Ecology			
Construction	Direct loss and physical disturbance to relevant benthic habitats and species from works carried out below MHWS within the Water Connection Corridor section of the Proposed Development Site; Physical disturbance to marine ecology from increased suspended sediment concentrations (i.e. increased turbidity and deposition) within the ZoI; Indirect effects to marine ecology from changes in marine water quality (excluding turbidity) within the ZoI; Underwater sound and vibration disturbance to marine ecology within the ZoI; Indirect effects to marine ecology from hydromorphological changes (e.g. changes to water flow or sediment movement) within the ZoI; Introduction and spread of INNS during any in-river works; Collisions between project vessels and marine mammals; and indirect effects on commercial fish and shellfish species.	Physical disturbance to marine ecology from changes in the airborne soundscape and visual disturbance during construction within the ZoI.	River and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which has the potential to disturb seals that have surfaced or have hauled out. However, the nearest haul out site for seals is Hilbre Island in the mouth of the Dee Estuary over 15 km downstream of the Proposed Development Site. Due to the intervening distance, there will be no available pathway and therefore no likely significant effect to seals and/or other marine mammals from changes in the airborne soundscape and visual disturbance is proposed to be scoped out from further assessment.
Operation	Indirect effects to marine ecology from any changes to existing thermal and chemical effects from treated water discharge (subject to control under an Environmental Permit that will be required for discharges); Indirect effects to marine ecology from hydromorphological changes (e.g. changes to water flow or sediment movement) within the ZoI; Physical disturbance and potential mortality to marine ecology from entrainment and impingement within the cooling water abstraction and discharge infrastructure within the Water Connection Corridor; Temporary increase in SSC from potential maintenance dredging leading to contaminant mobilisation turbidity and smothering effects on subtidal habitats and species;	Physical disturbance to marine ecology from changes in the underwater sound, and visual disturbance during operation	The operational phase of the Proposed Development will not result in changes to underwater sound, or visual disturbance which will impact marine habitats or species.

	Effects to intertidal habitats and species (including fish) from the deposition of airborne pollutants (e.g. from emissions from the power plant stacks during operation); and Changes in the airborne soundscape during operation.
Decommissioning	Potential impacts to marine ecology receptors during the decommissioning phase are assumed to be similar to the construction phase.

11. Water Environment and Flood Risk

11.1 Introduction

11.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on Water Environment and Flood Risk. The water environment assessment will consider potential impacts on water quality, water resources, hydrology, hydromorphology, flood risk and drainage of surface water and groundwater features, including rivers, lakes, canals, estuaries and aquifers.

11.1.2 This has been informed by a review of the environmental baseline conditions, along with identification of the anticipated key issues likely to be associated with the Proposed Development.

11.1.3 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report, as well as **Chapter 9: Terrestrial and Aquatic Ecology**, **Chapter 10: Marine Ecology**, **Chapter 12: Geology and Ground Conditions**, and **Chapter 14: Physical Processes**.

11.1.4 This chapter is also supported by the following figures:

- **Figure 11-1:** Surface Water Features;
- **Figure 11-2:** WFD Waterbodies;
- **Figure 11-3:** Development Advice Map Zones;
- **Figure 11-4:** Flood Map for Planning (Rivers and Seas); and
- **Figure 11-5:** Surface Water Flood Risk.

11.2 Legislation, Policy and Guidance

11.2.1 In accordance with NPS EN-1 and the PPW, applications for energy projects of 1 ha or greater in Flood Zone C and Flood Zone B are to be accompanied by a Flood Consequences Assessment (FCA).

11.2.2 A brief summary of the applicable national, regional and local legislation, policy and guidance related to this assessment is provided below:

- National Legislation and Policy:
  - The Overarching NPS for Energy (EN-1);
  - The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
  - The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
  - The NPS for Electricity Networks Infrastructure (EN-5);
  - PPW;
  - TAN 15: Development, flooding and coastal erosion 2021[174];

[174] Welsh Government (2021). Planning Policy Wales. Technical Advice Note 15 Development, flooding and coastal erosion

- Sustainable Drainage System (SuDS) Standards for Wales 2019[175];
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 ('WFD');
- Environment (Wales) Act 2016;
- The Groundwater (Water Framework Directive) (Wales) Directions 2016[176];
- The EPR 2016;
- The Shalleifh Water Protected Areas (England and Wales) Directions 2016[177]
- Water Strategy for Wales 2015[178];
- Water Act 2014[179];
- Flood and Water Management Act 2010[180];
- The Groundwater (England and Wales) Regulations 2009[181]; and
- Water Resources Act 1991[182].

- Regional and local planning policy:
  - FCC LDP;
  - Flintshire Strategic Flood Consequence Assessment 2018[183]; and
  - North West England and North Wales Shoreline Management Plan (SMP22)[184].
- Good Practice Guidance:
  - PINS Advice Note 18: The Water Framework Directive[185];
  - Construction Industry Research and Information Association (CIRIA) C811 Environmental Good Practice on Site[186];
  - CIRIA C532 Control of Water Pollution from Construction Sites[187];
  - CIRIA C648 Control of Water Pollution from Linear Construction Sites[188];

[175] Welsh Government (2019). Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems
[176] *The Groundwater (Water Framework Directive) (Wales) Direction 2016 (SI 2016/W.14)*. London: HMSO
[177] Welsh Government, 2016. *The Sellfish Water Protected Areas (England and Wales) Directions 2016.*
[178] Welsh Government, 2015; *Water Strategy for Wales, supporting the sustainable management of our natural resources* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2019-06/water-strategy.pdf (Accessed November 2023)
[179] *Water Act 2014* (c. 21). London: HMSO.
[180] *Flood and Water Management Act 2010* (c. 29). London: HMSO.
[181] *The Groundwater (England and Wales) Regulations 2009* (SI 2009/2902). London: HMSO.
[182] *Water Resources Act 1991* (c. 57). London: HMSO.
[183] FFF, 2018; *Strategic Flood Consequence Assessment Flintshire (2018)* [Online] Available at: https://www.flintshire.gov.uk/en/PDFFiles/Planning/Evidence-Base-Documents/Natural-Built-Environment/LDP-EBD-EN1-Strategic-Flood-Consequences-Assessment-Final-Report-2018.pdf (Accessed November 2023)
[184] North West & North Wales Coastal Group (2011). North West England and North Wales Shoreline Management Plan SMP22. Available online: https://www.mycoastline.org.uk/shoreline-management-plans/
[185] PINS, 2017; *Advice Note Eighteen - The Water Framework Directive* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/
[186] CIRIA, 2023; Environmental good practice on site guide (fifth edition) (C811). London: CIRIA.
[187] CIRIA, 2001; Control of water pollution from construction sites. Guidance for consultants and contractors (C532). London: CIRIA.
[188] CIRIA, 2006; Control of Water Pollution from Linear Construction Sites (C648). London: CIRIA.

- Statutory Standards for sustainable drainage systems – designing, constructing, operating, and maintaining surface water drainage systems[189]; and
- Flood Risk Assessment Guidance for New Development (FD2320/TR2)[190].

11.3 Assumptions, Limitations and Uncertainties

11.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

11.3.2 It is not anticipated that any upgrades to the Existing Natural Gas Connection Corridor or the Repurposed CO_2 Connection Corridor, beyond the scope of routine maintenance, will be required during construction of the Proposed Development as described in **Chapter 3: The Proposed Development**, and therefore no impact is likely on the receiving water environment or flood risk.

11.3.3 The key uncertainties associated with the water environment and flood risk assessment are as follows:

- the potential requirement to upgrade or replace existing cooling water infrastructure is subject to ongoing technical studies. Depending on the choice, inclusion of new infrastructure has the potential for additional effects to the water environment and flood risk, and may require additional surveys, modelling and consultation;
- the quantity and quality of discharge that will result from the operation of the Proposed Development to the Dee Estuary has not yet been subject to assessment; and
- due to the above, additional water quality or sediment modelling may be required to support the EIA.

11.4 Baseline Conditions

Study Area

11.4.1 For the purposes of this scoping assessment, the study area is up to 2 km from the Site in terms of surface water receptors and 1 km in terms of groundwater receptors. This has been determined as the potential direct hydrological and hydrogeological areas of influence that will allow all WFD water bodies and other features that may be impacted to be identified. Given the location of the Proposed Development adjacent to the Dee Estuary, the ultimate receptor of all potential effects to water environment will be the Dee Estuary.

11.4.2 The extent of the study area will be reviewed during the development of the ES. Should dispersion modelling or water quality modelling from the cooling

[189] Welsh Government, 2018; *Statutory standards for sustainable drainage systems- designing, constructing, operating and maintaining surface water drainage systems* [Online] Available at: https://www.gov.wales/sites/default/files/publications/2019-06/statutory-national-standards-for-sustainable-drainage-systems.pdf (Accessed November 2023)
[190] DEFRA / Environment Agency, 2005; *Flood Risk Assessment Guidance for New Developments* [Online] Available at: https://assets.publishing.service.gov.uk/media/602d03db8fa8f50388f9f02e/Flood_risk_assessment_guidance_for_new_development_-_phase2_overview__technical_report.pdf (Accessed November 2023)

water outfall be required, a wider zone of influence from the point of discharge will be considered.

Sources of information

11.4.3 To inform the scoping exercise, data, information and records relating to surface water, groundwater and flood risk features, resources and receptors were gathered from a number of publicly available online sources including:

- NRW - Water Watch Wales Map Gallery[191];
- Environment Agency Catchment Data Explorer[192];
- MAGIC website;
- NRW Development Advice Map[193];
- NRW Flood Maps for Planning[194];
- British Geological Survey (BGS) Geology Viewer[195];
- Groundwater Source Protection Zones (SPZs)[196];
- UK Topographic Map[197];
- Online OS Mapping;
- Online BGS GeoIndex website[198];
- Cranfield University, Soilscapes[199];
- National Library of Scotland Georeferenced Maps website[200];
- National River Flow Archive[201];
- FCC LDP;
- UK Centre for Ecology & Hydrology – Flood Estimation Handbook (FEH) Web Service[202];
- NRW - River levels, rainfall, and sea data[203];

[191] Natural Resources Wales, 2023; *Water Watch Wales* [Online] Available at: https://waterwatchwales.naturalresourceswales.gov.uk/en/ (Accessed November 2023)
[192] Environment Agency, 2023; Catchment Data Explorer [Online] Available at: https://environment.data.gov.uk/catchment-planning) (Accessed November 2023)
[193] NRW, 2023; *Development Advice Plan (DAM)* [Online] Available at: https://fehweb.ceh.ac.uk/ (Accessed November 2023)
[194] NRW, 2023; *Flood Maps for Planning* [Online] Available at: https://flood-map-for-planning.naturalresources.wales/ (Accessed November 2023)
[195] BGS, 2023; *Geology Viewer* [Online] Available at: https://geologyviewer.bgs.ac.uk/ (Accessed November 2023)
[196] Environment Agency, 2019; *Groundwater Source Protection Zone* [Online] Available at: https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs (Accessed November 2023)
[197] Topographic Map, 2023; *UK Topographic Map* [Online] Available at: https://en-gb.topographic-map.com/map-cgt/United-Kingdom/ (Accessed November 2023)
[198] BGS, 2023; *GeoIndex* [Online] Available at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ (Accessed November 2023)
[199] Cranfield University, 2023; *Soilscapes viewer* [Online] Available at: http://www.landis.org.uk/soilscapes/ (Accessed November 2023)
[200] National Library of Scotland, 2023; *Georeferenced Maps* [Online] Available at: https://maps.nls.uk/geo/find/#zoom=12.4&lat=51.20338&lon=-1.45160&layers=102&b=1&z=0&point=0,0 (Accessed November 2023)
[201] National River Flow Archives, 2023; *National River Flow Archives* [Online] Available at: https://nrfa.ceh.ac.uk/data/search (Accessed November 2023)
[202] UK Centre for Ecology & Hydrology, 2023; *Flood Estimation Handbook Web Service* [Online] Available at: https://fehweb.ceh.ac.uk/ (Accessed November 2023)
[203] Natural Resources Wales, 2023; *River levels, rainfall and sea data* [Online] Available at: https://fehweb.ceh.ac.uk/ (Accessed November 2023)

- Connah's Quay Power Station Site – Flood Consequences Assessment (2021)[204];
- Connah's Quay Northern Site – Flood Consequences Assessment (2021)[205];
- Connah's Quay Southern Site –Flood Consequences Assessment (2021)[206]; and
- Connah's Quay Hydrogen – North Site Evaluation Report (2022)[207].

11.4.4 Additional information on water quality, resources (i.e. consented discharges, licensed abstractions and private water supplies, and historic pollution incidents) will be requested from the relevant organisations and added at the PEIR and ES Stage.

11.4.5 Information on the ecological potential of water features will also be evaluated at later stages of the assessment as survey results become available. A site walkover will also be carried out to inform the impact assessment.

11.4.6 Baseline conditions have been established for:

- topography, land use, climate and geology;
- surface water features;
- groundwater features;
- hydromorphology;
- water resources;
- water-dependent ecological areas and relevant protected species; and
- flood risk.

Topography and Land-use

11.4.7 The Main Site, Electrical Connection Corridor and Indicative Enhancement Area (as shown on **Figure 1-3 (Appendix A)**) are characterised by flat, low-lying coastal topography with typical ground levels of approximately 6 m to 8 m AOD. The Water Connection Corridor is similar to the aforementioned sites, with the northern portion extending out into the lower marshland and River Dee channel to the north (approximately 3 m to 4 m AOD).

11.4.8 The Main Site, Electrical Connection Corridor, Indicative Enhancement Area and Water Connection Corridor are bounded to the south-west by the North Wales Main Line railway and to the north-east by the River Dee and associated floodplain/marshland. The A548 passes over the River Dee between The Main Site/Water Connection Corridor and Indicative Enhancement Area.

[204] S M Foster Associates Limited, 2021; *Connah's Quay Power Station Site – FCA*
205 S M Foster Associates Limited, 2021; *Connah's Quay Northern Site – FCA*.
[206] S M Foster Associates Limited, 2021; *Connah's Quay Southern Site – FCA*.
[207] Uniper Hydrogen Limited, 2022; *Connah's Quay Hydrogen – North Site Evaluation Report*. January 2022.

11.4.9 The Repurposed CO_2 Connection Corridor extends from the Main Site rising upslope towards the Proposed CO_2 Connection Corridor (ground levels ranging from approximately 36 m AOD to 48 m AOD).

11.4.10 The land use in the south-east of the Main Site is predominantly industrial, containing the existing Connah's Quay Power Station, with arable/grasslands surrounding the site to the west, and the River Dee to the north. The Indicative Enhancement Area is constrained by the River Dee to the north and east, with the remainder surrounded by built-up land, with the power station to the north-west and the residential areas of Kelsterton and Golftyn to the south-west.

Surface Waterbodies and Features

11.4.11 The study area is contained within the Dee Estuary Water Framework Directive (WFD) Operational Catchment, within the Dee Management Catchment. In total, the study area includes four WFD waterbodies, including two surface WFD waterbodies, one transitional WFD water body and one groundwater body (as shown on **Figure 11-2 (Appendix A)**). However, the WFD applies to all surface watercourses within each water body catchment, including minor tributaries, ditches and surface water drains that are connected to the WFD waterbodies.

11.4.12 The River Dee is a designated Main River[208] and flows south-east to north-west along the Site Boundary. The river is defined as part of the Dee Estuary at this location. The FEH webservice catchment models[202] indicate that, on entry to the estuary, the River Dee drains a catchment area of approximately 1,800 km^2. There is a continuous area of low-lying marshland and tidal mudflats between the Main Site, Electrical Connection Corridor and Indicative Enhancement Area boundaries, and the main river channel. The Water Connection Corridor extends into the main river channel including intertidal and sub-tidal areas that are below MHWS. Further information on the Dee Estuary is provided in **Chapter 10: Marine Ecology** and **Chapter 14: Physical Processes**.

11.4.13 Whilst the Dee Transitional Waterbody is the dominant surface water feature in the vicinity of the Site, online OS mapping indicates the following surface watercourses within the study area (these are shown on **Figure 11-1 (Appendix A)**):

- Kelsterton Brook – Kelsterton Brook is an ordinary watercourse that rises south of the study area at Mole Road and flows in a northerly direction towards the Main Site. The brook is culverted immediately upstream of Kelsterton Lane, and the A548, prior to appearing to flow in an easterly direction to the south of the North Wales Main Line railway, and joining flows from a number of unnamed tributaries, prior to being culverted beneath the Main Site to the Dee Estuary;
- Lead Brook / Northop Brook – The Lead Brook is an ordinary watercourse that flows south to north through the study area. The brook arises as Northop Brook to the south of Northop and flows in a northerly direction to become Lead Brook. Upstream of Oakenholt, the watercourse is impounded to form a local reservoir (Oakenholt

[208] Main rivers are usually larger streams and rivers but also include some smaller watercourses. In Wales, main rivers are legally designated by Natural Resources Wales.

Reservoir). The watercourse is culverted beneath Oakenholt Mills and the railway before discharging to a wide-open channel that extends along the full length of the western boundary of the Main Site, before eventually discharging to the River Dee through a tidal reach. The Repurposed CO_2 Connection Corridor intersects the Lead Brook in the culverted section (NGR SJ 26271 71670). Adjacent to the Main Site boundary upstream of the A548 culvert, Lead Brook drains a catchment of 3.05 km^2;

- Pentre Brook – Pentre Brook is an ordinary watercourse that rises in Flint Mountain and flows in a generally north-easterly direction. The brook flows approximately 480 m west of the Proposed CO_2 Connection Corridor, through Pentre Ffwrndan, prior to discharging to the River Dee estuary. Tributaries of Pentre Brook are crossed by the Repurposed CO_2 Connection Corridor, and one may be impacted by the Proposed CO_2 Connection Corridor;
- Wepre Brook – Wepre Brook is a WFD water body and is designated as a Main River. The watercourse arises in Soughton, from which it flows in a generally north-easterly direction past Northop Hall, where it crosses under the B5125. Its course then continues in a north-easterly direction through Wepre Park and beneath Connah's Quay High Street, where it enters the River Dee approximately 1.5 km south-east and upstream of the Site Boundary. The Proposed Development does not encroach in the catchment of this watercourse, and is not hydrologically connected and therefore is scoped out of further assessment;
- Swinchiard Brook – Swinchiard Brook is a WFD water body. The ordinary watercourse originates as two tributaries, Afon Conway and Afon Nant-y-Fllint, which converge within the study area to the west of Halkyn Road, and the watercourse then flows through the western edge of the study area (approximately 1.7 km west of the Proposed Development) in a northerly direction, proceeding in a northerly direction through the town of Flint, prior to flowing through a culvert under the Holywell Road and then discharging to the River Dee Estuary at Flint Marsh. The Proposed Development does not encroach on the catchment of this watercourse, and is not hydrologically connected and therefore is scoped out of further assessment;
- unnamed tributaries south of Main Site - There are a number of unnamed (ordinary) watercourses which arise to the south of the Main Site within the study area. These all flow in a generally northerly direction towards the River Dee Estuary. The easterly of these watercourses are tributaries of Pentre Brook and are crossed by the Repurposed CO_2 Connection Corridor, and one of these is potentially impacted by the Proposed CO_2 Connection Corridor. The central of the unnamed tributaries flows in a northerly direction through the Rockcliffe area in an open channel before entering a culvert beneath the A548 and Glantreath Farm, to emerge flowing north-west adjacent to the North Wales Main Line railway, and eventually discharges to Lead Brook at the point of emergence at the western Site Boundary (catchment of 0.84 km^2 at Glantreath Farm). The westerly of the unnamed tributaries also flows in a northerly direction, is culverted beneath the A548 and Kelsteron roundabout, and then flows into the culvert beneath the Main Site. There

are also some other minor tributaries located in the vicinity of the Indicative Enhancement Area;

- open water features – There are three ponds that have formed in shallow lined depressions established as part of the designated Dee Estuary Ramsar site, SAC, SPA and SSSI north-west of the Main Site, between the Main Site and Lead Brook; and
- water features on the northern bank of the River Dee – There are a number of small tributaries which feed into the main Dee Transitional water body which fall within the 2 km of the Existing Natural Gas Grid Connection Corridor. In addition, there are a number of open water features on the north bank, including RSPB Burton Mere Wetland and Shotwick Lake. The Existing Natural Gas Grid Connection is existing infrastructure and no significant works or disturbance is anticipated to impact the watercourses. These watercourses and water features are therefore scoped out from further assessment.

11.4.14 It is noted that the existing Connah's Quay Power Station in the south-east of the Main Site has an extensive surface water drainage system that conveys surface water directly to the River Dee upstream of the Main Site; this drainage network is not considered to be a receiving water feature in terms of this assessment.

11.4.15 The WFD waterbodies and water features that may potentially be impacted by the Proposed Development are presented in **Table 11-1**.

Table 11-1 Water features which interact with the Proposed Development

Water Feature	WFD Water body	Watercourse Type	Relevance to Proposed Development	Scope in/Out
River Dee	Dee WFD (transitional) water body	Transitional	Proposed Development located adjacent to the River Dee where it encroaches upon and passes through to connect to an Existing Natural Gas Connection Corridor. Cooling water / process water discharges into the Dee Estuary.	**In**
Kelsterton Brook	Dee WFD (transitional) water body	Freshwater	Brook appears to be culverted beneath the Main Site.	**In**
Lead Brook / Northop Brook	Dee WFD (transitional) water body	Freshwater	Repurposed CO_2 Connection Corridor crosses Lead Brook approximately 200 m from Main Site.	**In**
Pentre Brook	Dee WFD (transitional) water body	Freshwater	Potentially down gradient / downstream of Repurposed and Proposed CO_2 Connection.	**In**
Wepre Brook	Wepre Brook	Freshwater	Approximately 1.7 km south-east of Proposed Development, upgradient, thus no hydrological connection.	Out
Swinchiard Brook	Swinchiard Brook	Freshwater	Approximately 1.6 km north-west of Proposed Development, separated by Pentre Brook, thus no hydrological connection.	Out

Water Feature	WFD Water body	Watercourse Type	Relevance to Proposed Development	Scope in/Out
Unnamed stream streams south of Main Site	Dee WFD (transitional) water body	Freshwater	Various small watercourses that may all potentially be impacted by the Proposed Development by either being crossed by the Repurposed CO_2 Connection Corridor, crossing the Main Site, or being downgradient of the Proposed Development.	**In**
Unnamed streams and open water features on northern bank of River Dee	Dee WFD (transitional) water body	Freshwater	Unnamed streams which are tributaries of the River Dee and open water features are located within 2 km of the Existing Gas Natural Gas Grid Connection Corridor, including one tributary crossed by the corridor. These sites will not be impacted by the construction, operation or decommissioning of Proposed Development as they are positioned on the opposite bank of the River Dee, without any hydrological connections to activities. Despite falling within 2 km of the Existing Natural Gas Connection Corridor, where minimal additional works are anticipated, and therefore no impacts anticipated to these water features.	Out

WFD Waterbodies

11.4.16 The WFD waterbodies that may be impacted by the Proposed Development include the Dee Estuary (transitional water body) (ID: GB531106708200), and the Dee Carboniferous Coal Measures (CCM) groundwater body (ID: GB41102G204800). A summary of their current status and classification is shown on **Table 11-2**.

Table 11-2 WFD Waterbodies potentially impacted by the Proposed Development (Cycle 3, 2021)

WFD Water body & ID	Type	Designation	Status	
River Dee (GB531106708200)	Estuarine	Heavily modified	Overall	Moderate
			Ecological	Good
			Chemical	Moderate
			Hydromorphology status	Supports Good
			Target status	Good (2021)
Dee Carboniferous Coal Measures (GB41102G204800)[209]	Groundwater	No designation	Overall	Poor
			Quantity	Good

[209] This groundwater body covers the entire study area and is therefore not shown on Figure 11-2.

Water quality and flow data

11.4.17 NRW monitors the Dee transitional water body at seven locations for chemical status. Data will be requested from NRW for further analysis at the PEIR and ES stages of the impact assessment.

11.4.18 There are no gauging stations within the Proposed Development study area to provide baseline data on flow. However, three stations are located south-east of the Proposed Development, broadly 16 km to 17 km in a straight line. These include the Dee at Chester Suspension Bridge (Station NGR: SJ410659), the Dee at Ironbridge (Station NGR: SJ4180060020) and further upstream, the Dee at Farndon (Station NGR: SJ4121154347). Information on the Dee Estuary tidal regime is provided in **Chapter 14: Physical Processes**.

11.4.19 It is currently not proposed to undertake water quality monitoring prior to the PEIR stage given the availability of water quality data from routine NRW monitoring. However, at the PEIR stage, once further information on potential discharges becomes available, if additional data is required to support proposed assessments (see Section 11.3) water quality monitoring or other field data collection may be required, in consultation with NRW. Sediment quality data for the Dee Estuary is summarised in **Chapter 14: Physical Processes**.

Hydromorphology

11.4.20 The SMP22 describes the mouth of the Dee Estuary as being characterised by several channels and sandbanks. It states that much of the Welsh bank of the estuary has industrial and commercial activities at the shoreline, including factories and power stations, as well as the North Wales Main Line railway and roads. The extensive inter-tidal flats, and the waterfowl that use them, are protected by environmental conservation designations. The long-term plan under the SMP22 is to continue to manage risks to commercial and industrial assets from flooding and erosion, but to also allow more natural evolution where appropriate. In order to mitigate the impacts of the defences on the evolution of the estuary in combination with expected long-term future sea level rise, the plan allows for creation of areas of new habitat by moving defences inland where opportunities exist. Managed realignment was therefore assessed as an alternative policy at a number of locations within the Dee.

11.4.21 The existing Connah’s Quay Power Station occupies an area of reclaimed land which was previously an expanse of clay-silt-sand-based alluvium deposits. Expansive sandbars were prominent at the site between 1885 and 1900, with a single-thread meandering channel, before entering the Irish Sea.

11.4.22 Today, the estuary has had industrial properties built along the south-western edge, including flood defences, which alongside climate change has the potential for further loss of salt-marsh. The main channel of the River Dee, which flows in from the east-side of the estuary, is also heavily modified, exhibiting a canalised and regular planform upstream of Connah’s Quay.

11.4.23 Superficial deposits of the transitional water body mainly consist of alluvium deposits, which stretch across much of the current urban area on the right-bank where the A548 passes over, highlighting that the transitional body was

once a lot wider than is currently observed today. Further inland, glaciofluvial sands and gravel and Devensian till further where loam to clayey loam is observed as the predominant parent material.

11.4.24 The estuary is macro-tidal where a mean spring tidal range at Hilbre Island at the far west of the estuary is recorded at 7.6 m and is restricted to 3.4 m by Connah's Quay due to the entering river flow and bathymetry. Flood tidal currents are stronger than ebbing tides which promotes the accretion of sediments within the estuary[210]. The estuary is considered to be a major sink for both mud and sand, with the key source of sediment being the onshore movement of sediment from the Irish Sea.

11.4.25 Further information on the Dee Estuary and coastal processes is provided in **Chapter 14: Physical Processes**.

11.4.26 A walkover survey of freshwater features that may be affected by the Proposed Development will be undertaken to develop a fluvial hydromorphology baseline. The results of this walkover will be presented at the PEIR and ES stages.

Groundwater

11.4.27 The following sections provide a summary of existing ground conditions within the Site and 1 km study area. Further information on the geological baseline conditions are presented in **Chapter 12: Geology and Ground Conditions**.

Superficial Deposits

11.4.28 The BGS 1:50,000 scale map sheet 108 (Flint) shows made ground mapped below the Main Site, Electrical Connection Corridor and the Indicative Enhancement Area. Made ground is not recorded below the Proposed CO_2 Connection Corridor or the Water Connection Corridor. However, it is recorded below the Repurposed CO_2 Connection Corridor and the Existing Natural Gas Connection Corridor. Made ground comprises clay, clayey sand with gravel and clinker, pulverised fuel ash and occasional concrete and brick.

11.4.29 Tidal Flat Deposits, comprising unconsolidated clay, silt and sand are present associated with the River Dee and located to the east of, and parallel to, the A548 and the North Wales Main Line railway. The Tidal Flat Deposits underlie the Site, with the exception of the Repurposed and Proposed CO_2 Connection Corridor. Underlying the Proposed CO_2 Connection Corridor, Glacial Till is mapped, comprised of diamicton. Isolated pockets of Head, comprising clay, silt and sand, and Glaciofluvial Deposits, comprising sand and gravels, are also crossed by the Proposed CO_2 Connection Corridor.

Bedrock Geology

11.4.30 The geology within the study area and underlying the Site is complex and heavily faulted. A summary of the geology is outlined below:

[210] Sefton Council (2013). *Dee Estuary: North West Estuaries Processes Reports*. Prepared by Ch2MHill for Sefton Council.

- The Pennine Lower Coal Measures Formation (PLCMF), described by the BGS as 'interbedded grey mudstone, siltstone, and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part', is the predominant formation within the Study Area. PLCMF underlies the: north-western and south-eastern extents of the Main Site; the Water Connection Corridor; Electrical Connection Corridor; Indicative Enhancement Area and the majority of the Repurposed and Proposed CO_2 Connection Corridor.
- The Etruria Formation, in a north-south direction, crosses approximately in the centre of the Main Site. The Etruria Formation is described by the BGS as 'red, purple, brown, ochreous, green, grey' mottled mudstone, lenticular sandstone, and conglomerates referred as 'espleys'.
- To the west of the Etruria Formation, the Gwespyr Sandstone Formation is present, which is described by the BGS as 'Fine-grained, feldspathic and micaceous sandstones, cross-stratified on a variety of scales, with conglomerate-lined scours and intercalated siltstone and mudstone beds'. The Gwespyr Sandstone Formation is present below the approximate centre of the Main Site and is crossed by the Repurposed CO_2 Connection Corridor.
- Bowland Shale Formation, Chester Formation and Kinnerton Sandstone Formation are also present within the study area, but do not underlie the Proposed Development.

Aquifer Designations and Groundwater Levels

11.4.31 The Tidal Flat Deposits, Glacial Till, and Head deposits are classified by the Environment Agency/NRW[211] as Secondary Undifferentiated Aquifer defined as "*aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type*".

11.4.32 The Glaciofluvial Deposits are classified by the Environment Agency as Secondary A Aquifers defined as "*aquifers comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers*".

11.4.33 Bowland Shale Formation is designated a Secondary Undifferentiated Aquifer. Chester Formation and Kinnerton Sandstone Formation which are designated as Principal Aquifers defined as "*layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale*" The remaining bedrock formations are designated as a Secondary A aquifers.

11.4.34 There are a number of historic borehole records listed in the BGS GeoIndex Onshore website within or in the vicinity of the Site that provided groundwater level records. Available records of groundwater levels from historic boreholes are outlined below.

11.4.35 Groundwater levels in the geology between made ground (fly ash) to alluvial deposits varied from 0.6 m bgl (5 m AOD) to 6 m bgl (below ground level)

[211] NRW has adopted the Environment Agency's approach to protecting groundwater. Environment Agency, 2023; *Groundwater protection (collection)* [online]. Available at: https://www.gov.uk/government/collections/groundwater-protection

(2 m AOD) (BGS Borehole ID: SJ27SE23, SJ27SE300, SJ27SE301, SJ27SE16 and SJ27SE375). The groundwater level was recorded at 0.6 m bgl (5 m AOD) within the made ground (fly ash) (BGS Borehole ID: SJ27SE23) and 4 m bgl (2.6 m AOD) at Flint Sands geologic layer (BGS Borehole ID: SJ27SE300). The rest of the groundwater levels in the alluvial deposits varied from 2.3 m bgl (3 m AOD) to 6 m bgl (2 m AOD) (BGS Borehole ID: SJ27SE301, SJ27SE16 and SJ27SE375).

11.4.36 The closest WFD groundwater body to the Site is the Dee Carboniferous Coal Measures (CCM) groundwater body (see **Table 11-2**).

11.4.37 The Water Connection Corridor is partially located within the Dee Estuary which is designated as a groundwater-dependent terrestrial ecosystem (GWDTE)[212].

Water Resources

11.4.38 The location of surface water, and groundwater abstractions, information on pollution incidents, and discharge consents will be requested from NRW to inform the assessment. Details of PrWS abstractions will be requested from FCC.

11.4.39 The Proposed Development does not overlap with any Nitrate Vulnerable Zones (NVZ). However, there is an NVZ associated with the Principal Aquifers within the study area. The Dee CCM groundwater body is classified as a groundwater Drinking Protected Area.

Statutory Designated Sites

11.4.40 There are a number of statutory designated sites for nature conservation, including Ramsar, SSSI, SPA and Special SAC, as well as groundwater protection, and various types of vulnerable zones within the study area. The relevant designated sites are identified in **Table 11-3** with a justification of whether they are proposed to be scoped in or out.

Table 11-3 Statutory site designations

Name	Designation(s)	Description	Relevance to Proposed Development	Scope In/Out
Dee Estuary / Aber Afon Dyrydwy	Ramsar site; SPA; SAC; Shellfish Water Protection Area 2022	Large, funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. The site is of major importance for waterbirds.	Proposed Development discharges to, is adjacent to and is encroaching upon site, with potential upgrade/ construction and operation of new cooling water intake and discharge points.	**In**
Dee (West)	Shellfish Waters (Wales)	The Dee estuary downstream of Flint is classified as a Shellfish water.	The Dee Estuary adjacent to the Site is not classified as a Shellfish Water, with the designation over 2 km north-west of the Site; however, given that it is part of the Dee Estuary, there are	**In**

[212] Environment Agency (2023) Groundwater Dependent Terrestrial Ecosystems (England only) [online] Available at: https://www.data.gov.uk/dataset/72a149a2-1be7-441f-bc37-94a77f261e27/groundwater-dependent-terrestrial-ecosystems-england-only (Accessed: 16 November 2023)

Name	Designation(s)	Description	Relevance to Proposed Development	Scope In/Out
			potential effects that may propagate to the water.	
Mynydd Y Fflint / Flint Mountain	SSSI	Located along western branch of Pentre Brook. The SSSI is of special interest for its stands of unimproved neutral grassland and semi-natural broadleaved woodland, which occur in association with scrub, fen-meadow and swamp vegetation.	None of the Proposed Development is within the catchment of this SSSI and there is no hydrological connection.	Out
Connah's Quay Ponds and Woodland	SSSI, SAC	Site is located along Wepre Brook and tributaries. Part of the Deeside and Buckley Newts SAC. Designated due to the brook supporting one of the largest breeding populations of the great crested newt, as well as other amphibians.	None of the Proposed Development is within the catchment of this site and there is no hydrological connection.	Out
Neston, England	Groundwater NVZ (G3)	Groundwater NVZ, located on opposite bank of the Dee Estuary near Garden City where the A494 joins the A548.	None – located on opposite bank of River Dee from Main Site, therefore no hydrological connection.	Out

11.4.41 The Dee Estuary/Aber Afon Dyfrdwy is a designated Ramsar (UK11082) site, SSSI, SAC, and SPA (Marine Component GB). The Dee Estuary, and supported Shellfish Site, could potentially be impacted by the Proposed Development, due to the proximity to and hydrological relationship between the Dee Estuary and the Proposed Development.

11.4.42 All other designated sites are not hydrologically connected to the Site. There are no designated Bathing Waters located within 2 km of the Proposed Development or associated with the Dee Estuary.

Flood Risk

11.4.43 The Main Site, Electrical Connection Corridor, Indicative Enhancement Area, Water Connection Corridor and the Repurposed CO_2 Connection Corridor are all entirely or partially situated on the south bank of the River Dee, at the entry to the Dee Estuary. The Existing Natural Gas Connection Corridor is situated on the north bank of the River Dee and extends south connecting with the Water Connection Corridor. These sites are potentially at risk from fluvial, tidal and, to a lesser extent, surface water flooding.

11.4.44 The appropriate reference for consideration of flood risk and development potential is the NRW DAM. The DAM shows areas at risk of flooding from rivers and the sea for the purposes of land-use planning. The DAM supports PPW and TAN 15 to guide new development away from areas at risk of flooding wherever possible. The DAM presents undefended flood risk information, i.e. assuming that there are no existing flood defences. This approach allows for consideration of flood hazard related to failure or breach of defences. The definition of DAM flood zones are listed below:

- DAM Zone A: Considered to be at little or no risk of fluvial or tidal/coastal flooding.
- DAM Zone B: Areas known to have been flooded in the past evidenced by sedimentary deposits.
- DAM Zone C: Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal).
- DAM Zone C1: Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.
- DAM Zone C2: Areas of the floodplain without significant flood defence infrastructure.

11.4.45 However, it is noted that the DAM is due to be replaced by the new Flood Map for Planning (FMP) in 2024, and as such both flood maps have been utilised in this scoping chapter.

11.4.46 The DAM indicates that the majority of the south Dee Estuary bankside sites are within Flood Zone C1), and hence considered to be at risk of tidal flooding during flood events of up to 1:1000yr frequency (refer to **Figure 11-3 (Appendix A)**). The remainder of these sites are designated Flood Zone B. The Existing Natural Gas Connection Corridor is predominantly situated in Zone C2 and Zone B.

11.4.47 The location and extent of Flood Zone C1 on the DAM suggests potential for flood inundation from the western boundary of the Main Site.

11.4.48 The Repurposed CO_2 Connection Corridor south of the A548, and the Proposed CO_2 Connection Corridor, are not located within a flood zone for either the DAM or the NRW FMP.

11.4.49 In July 2023, the NRW FMP was updated. The FMP displays flood zones associated with rivers (fluvial), the sea (tidal). and surface water and small watercourses, assuming no defences are in place. The flood zones are defined as follows:

- Rivers – Flood zone 2: Areas with 0.1% to 1% (1 in 1000 to 1 in 100 year floods) chance of flooding from rivers in a given year, including the effects of climate change.
- Rivers – Flood zone 3: Areas with more than a 1% (1 in 100 year floods) chance of flooding from rivers in a given year, including the effects of climate change.
- Sea – Flood Zone 2: Areas with 0.1% to 0.5% (1 in 1000 to 1 in 200) chance of flooding from the sea in a given year, including the effects of climate change.
- Sea – Flood Zone 3: Areas with more than 0.5% (1 in 200) chance of flooding from the sea in a given year, including the effects of climate change.
- Surface Water and Small Watercourses – Flood Zone 2: Areas with 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.

- Surface Water and Small Watercourses – Flood Zone 3: Areas with more than 1% (1 in 100) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.

11.4.50 The FMP shows the development site to be predominantly Flood Zone 3 due to tidal flooding as shown on **Figure 11-5 (Appendix A)**.

11.4.51 In order to establish a baseline for the ES, a Flood Consequence Assessment (FCA) will need to be produced in accordance with the requirements of TAN 15 and PPW.

11.4.52 The FMP surface water and small watercourses flood map indicates areas of the Site are at risk of surface water flooding, particularly on the south bank including the Indicative Enhancement Area, the Alternative Access to Main Site and Access to Indicative Enhancement Area, and the Main Site (Flood Zone 2 and 3 - surface).

11.4.53 There is fluvial and surface water and small watercourses flood risk to the east of the Proposed CO_2 Connection Corridor, aligning with watercourses, which also intersects the Repurposed CO_2 Connection Corridor (Flood Zone 2 and 3 – rivers / surface water and small watercourses), refer to **Figure 11-5 (Appendix A)**.

11.4.54 The FMP indicates that there are no recorded incidents of historical flooding within the Site. The only recorded flood incidents in the area relate to localised flooding of small surface watercourses.

11.4.55 The flood risk from reservoirs mapping indicates that the southern boundary of the Main Site is at risk from flooding from Oakenholt Reservoir.

11.4.56 No hydraulic modelling is proposed as part of the EIA, as there is sufficient existing hydraulic modelling for this area to be provided by NRW and the Environment Agency. In the event that this is required at a later stage, then this will be agreed with NRW.

11.4.57 The previous FCA undertaken for the Site indicated that there is likely a need to raise the land in this area to mitigate flood risk; this will be considered as part of the Proposed Development specific FCA.

Table 11-4 Proposed Development areas and flood risk zone

Proposed development area	DAM flood zones	FMP flood zones (Sea)	FMP flood zones (River)	FMP flood zones (surface water and small watercourses)
Main Site	Flood Zone C1 and Flood Zone B	Flood Zone 3 and Flood Zone 2	-	Flood Zone 3, and Flood Zone 2
Water Connection Corridor	Flood Zone C2	Flood Zone 3	Flood Zone 3	Flood Zone 3, and Flood Zone 2
Existing Natural Gas Connection Corridor	Flood Zone C2 and Flood Zone B	Flood Zone 3	Flood Zone 3	Flood Zone 3
Electrical Connection Corridor	Flood Zone C1 and Flood Zone B	Flood Zone 3	-	Flood Zone 2
Indicative Enhancement Area	Flood Zone C1 and Flood Zone B	Flood Zone 3	-	Flood Zone 3, and Flood Zone 2

Proposed development area	DAM flood zones	FMP flood zones (Sea)	FMP flood zones (River)	FMP flood zones (surface water and small watercourses)
Alternative Access to Main Site and Access to Indicative Enhancement Area	Flood Zone C1 and Flood Zone B	Flood Zone 3	-	Flood Zone 3, and Flood Zone 2
Repurposed CO_2 Connection Corridor	Flood Zone C1 and Flood Zone B	Flood Zone 3	Flood Zone 3	Flood Zone 3, and Flood Zone 2
Access to Wildlife Hides	Flood Zone C1 and Flood Zone B	Flood Zone 3	-	None
Existing Surface Water Outfall	Flood Zone C2	Flood Zone 3	Flood Zone 3	Flood zone 3
Proposed CO_2 Connection Corridor	-	-	-	Flood zone 2

Planned Surveys

11.4.58 A walkover of the Site and the water features that have been scoped in for further assessment will be carried out by a suitably qualified water scientist and hydromorphologist. It is not proposed to undertake a full water features survey given that the potential effects will be focussed on the estuarine River Dee, which will be assessed within **Chapter 14: Physical Processes**.

11.4.59 Depending on the outcomes of the preliminary WFD screening assessment (see section 11.5), the need for further assessment will be determined in consultation with NRW. The extended WFD Screening (and where required Scoping) Assessment will be prepared at the PEIR stage and NRW consulted on the findings. In the event that more detailed assessment is necessary, this may need to be informed by and supported by quantitative water quality assessments, sediment studies and aquatic/marine ecology surveys (as required). The scope of any such surveys and assessments would be agreed with NRW.

11.5 Impact Assessment Methodology

Proposed consultation

11.5.1 Consultation will be undertaken with the following organisations as part of the water environment assessment process:

- NRW, including the flood risk and LIFE Dee River[213] Teams;
- Natural England;
- FCC; and
- Deeside Naturalists Society and other stakeholders as identified.

[213] The LIFE Dee River is a project to transform the River Dee and its catchment by restoring the river and its surroundings back to their natural state. Information on the project can be found at the following reference: NRW, 2023; *LIFE Dee River* [online]. Available at: https://naturalresources.wales/LIFEDeeRiver?lang=en

General Assessments

11.5.2 A qualitative surface and groundwater water impact assessment will be required which seeks to avoid the construction, operation and decommissioning stages of the Proposed Development having the potential for significant adverse effects on WFD waterbodies and other water features, including assessing compliance with the WFD and planning policy. This will be based on a source-pathway-receptor approach. It will consider construction, operation and decommissioning phases, including abstraction of water from the Dee Estuary, potential discharges of surface water, cooling and process water (noting that the current process discharges are not yet confirmed). Consideration of the management of foul water will also be included, although the current assumption is that this will be discharged to the nearest public sewer or be removed from site for treatment at a licensed treatment centre. Note that abstraction of water and discharge of cooling water to and from the Dee Estuary will also be considered within **Chapter 14: Physical Processes**. Mobilisation of contamination will be considered within **Chapter 12: Geology and Ground Conditions**.

11.5.3 Currently it is anticipated that the Repurposed CO_2 Connection Corridor will involve physical no works (subject to assessment of the safety case). The Proposed CO_2 Connection Corridor is not anticipated to cross any watercourses; however, this will be confirmed pending further desk study of background data and a walkover. A qualitative risk assessment of the risk to the physical form of freshwater features from the construction of the Proposed CO_2 Connection Corridor will be undertaken. If crossings are identified, a Watercourse Crossing Register will be created with a unique crossing reference for each watercourse that may be affected (noting that the precise crossing locations are unlikely to be known when the DCO Application is submitted but will be within the Order limits). In the event that watercourse crossings are required, a design optioneering exercise will be undertaken to determine a preferred option for any crossings. It is anticipated that intrusive crossings would be limited to the smaller and less important watercourses, with non-intrusive options proposed for any larger, more important watercourses identified. NRW and FCC will be consulted on the Watercourse Crossing Register.

11.5.4 An initial impact assessment will be undertaken to assess the potential effects on the water environment, including a desk study to review relevant legislation, policy and guidance. The initial assessment will be primarily qualitative and based on a source-pathway-receptor approach. The likely significance of effects will be determined using good practice guidance, where the importance of the receptor is determined separately from the magnitude of impact. Where required, the initial assessment will include recommendations for mitigation measures and the need for further assessment when more information is available on the Proposed Development.

11.5.5 Depending on the outcomes of the initial review and progress on the development proposals, the water quality impacts on the River Dee Estuary may be assessed through H1 screening assessment (comparison of effluent chemistry against water quality standards), dispersion modelling and sediment transport modelling, if required. The approach will be informed by

NRW's guidance on assessment of discharges to transitional and coastal waters and in accordance with EPR.

Flood Consequence Assessment

11.5.6 A FCA will be prepared and will consider the risks to the Proposed Development from flooding, as well as the potential for the construction and operation of the Proposed Development to increase flood risk off-site. NRW and relevant Lead Local Flood Authorities (LLFAs) will be consulted for local water and flood data to inform the assessments and to confirm the assessment approach, in particular around the treatment of existing NRW defences where these interface with the Proposed Development. The assessment of flood risk will also take into account the most recent climate change allowances published at the time of submission of the Application.

11.5.7 A Concept/ Outline Surface Water Drainage Strategy for the Main Site will be prepared to demonstrate how surface water run-off arising from the Proposed Development will be managed sustainably so as not to increase flood risk off-site.

Water Framework Directive Assessment

11.5.8 A WFD assessment will be carried out which addresses the requirements of the WFD to ensure there is no deterioration or prevention of improvement to any WFD water body, taking into account the conservation objectives of any relevant Protected Areas. The assessment will consider freshwater, groundwater and transitional waterbodies, and will be undertaken in accordance with the approach set out in PINS Advice Note 18: The Water Framework Directive and the Clearing the Waters for All guidance[214].

11.5.9 It is proposed that a Screening and Scoping WFD Assessment will be undertaken to define the components of the Proposed Development that are relevant, consider the impact pathways, assess the likely significance of any adverse impacts, and determine what the scope for mitigation might be. This will also consider the outputs of the impacts outlined in **Chapter 14: Physical Processes** and in **Chapter 12: Geology and Ground Conditions**. It is proposed to 'extend' this screening and scoping assessment to include a qualitative assessment of the Proposed Development to consider the potential for any non-compliance of the Proposed Development with WFD objectives for affected water bodies, using readily available information and site observations.

Surface, Foul and Process (Cooling) Water Strategies

11.5.10 An Outline Surface Water Drainage Strategy will be prepared which seeks to control the risk of surface water flooding so that it is not increased as a result of the Proposed Development.

11.5.11 It is currently anticipated that in accordance with planning policy and general good practice, embedded mitigation will be provided by restricting surface water discharge rates and providing on-site attenuation and treatment of surface water. Careful consideration of SuDS features, in-keeping with local planning policy and through liaison with the LLFA and NRW, will be given in

[214] Environment Agency, 2016; *Guidance: Water Framework Directive Assessments: estuarine and coastal waters* [online]. Available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters

developing the Outline Surface Water Drainage Strategy so that it adequately attenuates and treats run-off from the Proposed Development, whilst minimising flood risk to the Proposed Development Site and surrounding areas. Suitable SuDS options will be considered with reference to CIRIA C753 The SuDS Manual[215], the SuDS Standards for Wales, and the Supplementary Planning Guidance LPGN 29 – Management of Surface Water for New Development, adopted by FCC[216]. A semi-quantitative surface water quality risk assessment will be undertaken for above ground infrastructure using The SuDS Manual Simple Index Approach to ensure that the surface water drainage system provides adequate treatment of run-off. This will not apply to areas of the Proposed Development Site where hazardous chemicals will be stored and used, with the risk from these locations assessed qualitatively with reference to proposed spillage and containment measures and emergency incident response plans.

11.5.12 The water environment impact assessment / WFD assessment will be supported by a description of proposals for the management of foul and process water. At this stage, there is no information of what effluent will be generated and how it will be managed. Consultation with relevant statutory consultees will take place regarding the Applicant's proposals, where required.

11.5.13 In addition, water quality impacts may arise from the heat in the discharged cooling water or if the discharged water contains chemicals subject to environmental quality standards (EQS) in transitional waters which are not sourced from the River Dee abstraction. The potential impacts of the discharge will depend on the discharge rate, timing, total volume, temperature and chemistry as well as the location and configuration of the outfall. At this stage of design, technical assessments are ongoing to assist in scoping potential impacts and any required mitigation. Options for mitigation may include optimising the outfall configuration or providing on-site water treatment. The appropriate mitigation measures will be determined following development of the site design such that the characteristics, rates and volumes of the discharged effluent are further characterised. The scope of any modelling will be discussed with NRW.

11.5.14 The abstraction and discharge of large volumes of water to the River Dee has the potential to have localised impacts on sediment and increase erosion within the tidal River Dee channel, the impacts and potential likely significant effects are considered within **Chapter 14: Physical Processes**.

Determination of Effect Significance

11.5.15 The criteria to determine the likely significance of effects will be informed by the DMRB, LA113 Road Drainage and the Water Environment[217]. The DMRB guidance provides a methodology for identifying the potential impacts of construction and operation on the water environment and whether these impacts would result in a significant effect (adverse or beneficial). Although initially developed for highway projects, the assessment criteria are generic

[215] CIRIA, 2015; *The SuDS Manual (C753F)*. London: CIRIA.
[216] FCC, 2017; *Supplementary Planning Guidance, LPGN 29 – Management of Surface Water for New Developments* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Planning/Adopted-SPGNs/SPGN-No-29.-Management-of-Surface-Water-for-New-Development.pdf
[217] National Highways (Welsh Government), 2020; Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal- LA 113 Road Drainage and the Water Environment. Cardiff: Welsh Government.

and can be applied to any type of development. These criteria are used nationally and are considered a robust approach to the classification of likely effect significance.

11.5.16 In line with the DMRB guidance, the receptors will be classified as very high, high, medium or low importance, in accordance with the criteria shown in **Table 11-5**. The magnitude of impacts identified will be assessed using the criteria in **Table 11-6**. The likely significance of effects will then be classified based on the matrices provided in **Table 11-7**. Overall, effects that are moderate or major are considered likely to be significant in planning terms.

Table 11-5 Criteria to estimate the importance of water environment receptors

Importance[1]	Type of Receptor			
	Groundwater	Surface Water	Morphology[2]	Flood Risk[3]
High	Principal aquifer providing a regionally important resource and/or supporting a site protected under international and UK legislation Ecology and Nature Conservation. Groundwater locally supports GWDTE. SPZ 1	Watercourse having a WFD classification shown in a RBMP and Q95 > 1.0 m^3/s. Site protected/designated under international and UK legislation Ecology and Nature Conservation.	Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river type.	Highly vulnerable development falling under essential infrastructure category
Medium	Principal aquifer providing locally important resource or supporting river ecosystem. Groundwater supports a GWDTE. SPZ2	Watercourse having a WFD classification show in a RBMP and Q95 m3/s <1.0 m^3/s. Species protected under international or UK legislation Ecology and Nature Conservation.	Conforms closely to natural, unaltered state and would often exhibit well-developed and diverse geomorphic forms and processes characteristic of river type, with abundant bank side vegetation. Deviates from natural conditions due to direct and/or indirect channel, floodplain, and/or catchment development pressures.	Highly vulnerable development
Low	Secondary aquifer providing water for agricultural or industrial use with limited connection to surface water. SPZ3	WFD not having a WFD classification shown in a RBMP and Q95 >0.001 m^3/s.	Shows signs of previous alteration and / or minor flow regulation but still retains some natural features or may be recovering towards conditions indicative of the higher category.	Less vulnerable development.
Very low	Unproductive strata	Watercourses not having a WFD classification shown in a RBMP and Q95 <0.001 m^3/s.	Substantially modified by past land use, previous engineering works or flow regulation and likely to possess an artificial cross-section (for example trapezoidal) and would probably be deficient in bedforms and bankside vegetation. Could be realigned or channelised with hard bank protection, or culverted and enclosed. May be significantly impounded or abstracted for water resources use. Could be impacted by navigation, with associated high degree of flow regulation and bank protection, and probable strategic need for maintenance dredging. Artificial and minor drains and ditches would fall into this category.	Water compatible development.

1 Professional judgement is applied when assigning an importance category to all water features. All controlled waters are protected from pollution under the EPR 2016 and the Water Resources Act 1991 (as amended), and future WFD targets also need to be considered.

2 Based on the water body 'Reach Conservation Status' presently being adopted for HS2 (and developed originally by Atkins) and developed from the Environment Agency conservation status guidance.LA113 provides advice on hydromorphological assessment but does not provide criteria for determining hydromorphological receptor importance.

3 Highly vulnerable development, less vulnerable development and water compatible development are defined in the TAN 15 (2021) Guidance. The consideration of whether highly vulnerable development will be very high or high importance will be based upon the specific type of development.

Table 11-6 Criteria to determine the magnitude of impact

Magnitude of Impact	Criteria
High Adverse	Results in a loss of attribute and/or quality and integrity of the attribute.
Medium Adverse	Results in effect on integrity of attribute, or loss of part of attribute.
Low Adverse	Results in some measurable change in attribute's quality or vulnerability.
Very low	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity.
Low beneficial	Results in some beneficial effect on attribute or a reduced risk of negative impact occurring.
Medium beneficial	Results in moderate improvement of attribute quality.
High beneficial	Results in major improvement of attribute quality.
No Change	Not applicable.

Table 11-7 Criteria to determine the likely significance of effect

Importance of the Receptor/	Magnitude of Impact				
	High	**Medium**	**Low**	**Very Low**	**No Change**
High	Major	Major	Moderate	Minor	Not applicable
Medium	Major	Moderate	Minor	Negligible	Not applicable
Low	Moderate	Minor	Negligible	Negligible	Not applicable
Very low	Minor	Negligible	Negligible	Negligible	Not applicable

11.6 Embedded Mitigation

11.6.1 As far as reasonably practicable, potential likely significant adverse effects will be avoided through embedded design measures. For example, this may be through appropriate abstraction volumes, discharge rates and locations, or the design and operation of new structures within water features such as outfalls or intakes. However, where additional mitigation or potentially compensation measures are required, these will be determined and developed as part of an iterative design and impact assessment process.

11.6.2 Construction phase impacts will likely be mitigated through the implementation of standard construction techniques and mitigation measures, as are described in a wide range of good practice publications which will be listed in the ES (e.g. C811 Environmental good practice on site guide (fifth edition)).

11.6.3 The SuDS Manual Simple Index Approach (CIRIA C753) will be used to inform the design of the surface water drainage system so that it provides adequate treatment of run-off. This will not apply to areas of the Proposed Development Site where hazardous chemicals will be stored and used, with the risk from these locations assessed qualitatively with reference to proposed spillage and containment measures and emergency incident response plans. An initial site drainage and containment strategy has been developed to mitigate areas where hazardous chemicals will be stored or used, and will include suitable mitigation such as bunds to 110% of the

maximum capacity of any storage tank, and the use of holding tanks and raised kerb/bunded edges for areas with potential chemical or firewater usage.

11.6.4 In terms of flood risk, to mitigate against coastal and fluvial flooding, it is currently anticipated that some targeted ground raising may be required to increase ground levels above the existing average ground height of 7 m AOD in order to protect critical operational infrastructure from flood events and considering the effects of climate change. It is currently anticipated that parts of the Main Site may need to be raised by approximately 1 m. This estimated landraise for the Main Site is based upon an earlier FCA undertaken for the indicative site and is therefore subject to further assessment and potential revision.

11.7 Potential Effects

Construction (and decommissioning)

11.7.1 The potential effects of construction (and decommissioning) of the Proposed Development on surface water receptors include:

- potential temporary impacts on water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through uncontrolled site run-off:
  - on the Dee Estuary, Kelsterton Brook, Lead Brook and potentially unnamed tributaries from works at the Main Site; and
  - on Lead Brook, Pentre Brook, and unnamed tributaries from excavations and installation of the Proposed CO_2 Connection;
- potential temporary impacts on water levels and sediment dynamics if construction site run-off is discharged in an uncontrolled manner or if temporary crossings reduce conveyance:
  - on Kelsterton Brook, Lead Brook and potentially unnamed tributaries from works at the Main Site; and
  - on Lead Brook, Pentre Brook, and unnamed tributaries from excavations and installation of the Proposed CO_2 Connection;
- potential impacts on any water abstractions (if confirmed any are present);
- potential morphological impacts to freshwater courses where they may be crossed using intrusive techniques (noting that a Watercourse Crossing Register and decisions on the preferred crossing methods has not yet been made); while this would only be relevant for the unnamed tributary of Pentre Brook, the requirement to cross this has not yet been confirmed;
- water quality impacts on receiving watercourses from an increase in foul drainage from the construction laydown areas (note the current assumption is that this will be discharged to the nearest public sewer or be removed from site for treatment at a licensed treatment centre); and
- potential impact upon receiving watercourses as a result of hydrostatic testing of the Proposed CO_2 Connection Corridor (e.g. if a biocide is

used for this), which requires a source of clean water and a discharge point.

11.7.2 The potential effects of construction of the Proposed Development on groundwater receptors could include:

- contamination of groundwater and soil could result from leakage and spills of fuels, oils, chemicals and concrete during construction affecting watercourses indirectly via site run-off or directly where works are close to and within a water feature;
- construction and excavations which require dewatering could have a potential effect on groundwater quality and groundwater flow and levels as a result of groundwater abstraction and associated discharges;
- related to the above, subsurface structures and excavations could have an effect on groundwater quality and, in turn, on watercourses if situated nearby and connected to groundwater; and
- there will be no direct discharges to groundwater. However, the potential for contaminant mobilisation from the Proposed Development and the resultant impacts to groundwater will be considered within the Geology and Hydrogeology assessments.

11.7.3 The potential effects of construction of the Proposed Development on flood risk could include:

- potential impacts to water conveyance where proposed construction cross watercourses during construction (above and below ground);
- encroachment within Zones C1 and Zone B (including potentially the functional floodplain) could lead to the displacement of tidal and fluvial floodwater during construction (above ground);
- potential changes to existing surface water (pluvial) flows during construction phase;
- potential impacts of future flooding from all sources to and from the Proposed Development, including (but not limited to) a potential risk to construction workers during the construction phase, due to risk of fluvial/tidal and reservoir flooding;
- increase in volume and rate of surface water run-off from new impervious areas including compacted ground on the Main Site leading to an impact on flood risk;
- loss of floodplain volume due to encroachment on the floodplain;
- high groundwater levels will need to be managed for flood risk during foundation / deep excavation; and
- siltation and blockages within the drainage systems causing failure or improper function, which could impact hydrology through flooding.

11.7.4 The following potential construction impacts on surface water and groundwater receptors are addressed within other chapters within this scoping report:

- the impacts on surface water and groundwater quality through mobilisation of contamination following disturbance of contaminated

ground or groundwater are considered within **Chapter 12: Geology and Ground Conditions**; and

- potential temporary impacts on water levels, sediment dynamics, and physical impacts on the Dee Estuary are considered within **Chapter 14: Physical Processes**.

Operation

11.7.5 During operation and maintenance, the following potential impacts on surface water features may occur as a result of the Proposed Development:

- water quality impacts to the Dee Estuary and other surface water features that may receive surface water run-off, cooling water or treated effluent discharges from the Proposed Development. Options for discharge will be evaluated as part of the assessment process including any requirement for surface water modelling depending on the potential discharges. The Applicant will seek to agree the approach to assessing cooling water and/or treated effluent discharges with NRW;
- there are also potential water quality impacts to the Dee Estuary and other surface water features due to entry of contaminated run-off into the Dee Estuary as a result of chemical spills (e.g. from the chemical storage area or fire water if needed) and subsequent water quality impacts. The risk of this is anticipated to be mitigated through the Outline Surface Water Drainage Strategy and operational pollution prevention measures. The potential impacts will be assessed as part of the assessment process;
- hydromorphological impacts including changes to physical form of freshwater features (for example, scour or culverting), hydraulic processes and sediment dynamics (for example, constriction of flows or flood plain disconnection), which together underpin habitats in watercourses and their floodplains;
- impacts on surface water abstractions (if identified); and
- impact on water resources for other users and on protected habitats and species, as well as the sourcing of raw water sourced from the Dee Estuary, will be considered where relevant.

11.7.6 During operation and maintenance, the following potential effects on groundwater may occur as a result of the Proposed Development:

- contamination of groundwater as a result of chemical spills in the chemical storage area and its subsequent run-off;
- migration of contaminants following preferential pathways provided by the foundations of structures to non-contaminated soils, geology and groundwater;
- impediment and alteration of groundwater flow regime arising from foundations and subsurface structures, resulting in groundwater mounding up the hydraulic gradient and reduced groundwater levels down the hydraulic gradient; and
- potential impact on groundwater resources should an alternative water supply be required (i.e. groundwater abstraction). At present, water

supply is anticipated to be sourced from the Dee Estuary or from the existing abstraction on site.

11.7.7 During operation and maintenance, the following potential effects on flood risk may occur as a result of the Proposed Development:

- potential impacts to surface water conveyance during operation (above ground);
- encroachment within Zones C1 and Zone B (including potentially the functional floodplain) could lead to the displacement of tidal and fluvial floodwater during operation (above ground);
- potential changes to existing surface water (pluvial) flows;
- potential impacts of future flooding from all sources to and from the Proposed Development, due to risk of fluvial/tidal and reservoir flooding;
- potential increase in volume and rate of surface water run-off from new impervious areas on the proposed Main Site leading to a potential impact on flood risk and scour risk in receiving watercourses upstream and downstream;
- during a fluvial event, flood paths and levels could be altered and there could be an increased flood risk to the surrounding area. As such, flood compensation could also be required;
- potential for flood paths and levels to be altered and increased flood risk to the surrounding area should a breach of the tidal flood defences occur (residual flood risk); and
- increased surface water run-off from new impermeable areas could result in higher flow if run-off is not appropriately attenuated. This, in turn, could increase flood risk in the area. Run-off should be treated in accordance with the Sustainable Urban Drainage System (SuDS) hierarchy.

11.7.8 The potential impacts to the Dee Estuary from the potential presence of the abstraction and discharge infrastructure are considered in **Chapter 14: Physical Processes**.

11.8 Additional Mitigation

11.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

11.9 Summary of Potential Likely Significant Effects

11.9.1 A summary of the potential effects to be considered in the ES is presented in **Table 11-8** below.

Table 11-8 Summary of the potential likely significant effects to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Surface Water			
Construction	Potential temporary impacts on water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site run-off. Potential temporary impacts on water levels and sediment dynamics Potential impacts on any water abstractions (if confirmed any are present). Potential morphological impacts to freshwater features where they may be crossed using intrusive techniques (if present). Water quality impacts on receiving watercourses from an increase in foul drainage from the Proposed Development. Potential impact upon receiving watercourses as a result of hydrostatic testing of the Proposed CO_2 Connection Corridor.	N/A	N/A
Operation	Water quality impacts to the Dee Estuary and other surface water features that may receive surface water run-off, cooling water or treated effluent discharges from the Proposed Development. Entry of contaminated run-off into the Dee Estuary as a result of chemical spills (e.g. from the chemical storage area or fire water if needed) and subsequent water quality impacts. Hydromorphological impacts to freshwater features, including changes to physical form (for example scour or culverting), hydraulic processes and sediment dynamics (for example constriction of flows, flood plain disconnection), which together underpin habitats in watercourses and their floodplains. Impacts on surface water abstractions (if identified). Impact on water resources for other users and on protected habitats and species will be considered where relevant.	N/A	N/A
Decommissioning	Assumed similar to the construction phase.	N/A	N/A
Flood Risk			
Construction	Potential impacts to water conveyance where proposed construction cross watercourses during construction (above and below ground). Encroachment within Zones C1 and Zone B (including potentially the functional floodplain) could lead to the displacement of tidal and fluvial floodwater during construction (above ground). Potential changes to existing surface water (pluvial) flows during construction phase.	N/A	N/A

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
	Potential impacts of future flooding from all sources to and from the Proposed Development, including (but not limited to) a potential risk to construction workers during the construction phase, due to risk of fluvial/tidal and reservoir flooding. Increase in volume and rate of surface water run-off from new impervious areas including compacted ground on the Main Site leading to an impact on flood risk. Loss of floodplain volume due to encroachment on the floodplain. High groundwater levels will need to be managed for flood risk during foundation / deep excavation. Siltation and blockages within the drainage systems causing failure or improper function, which could impact hydrology through flooding.		
Operation	Potential impacts to surface water conveyance during operation (above ground). Encroachment within Zones C1 and Zone B (including potentially the functional floodplain) could lead to the displacement of tidal and fluvial floodwater during operation (above ground). Potential changes to existing surface water (pluvial) flows. Potential impacts of future flooding from all sources to and from the Proposed Development, due to risk of fluvial/tidal and reservoir flooding. Potential increase in volume and rate of surface water run-off from new impervious areas on the proposed Main Site leading to an impact on flood risk and scour risk in receiving watercourses upstream and downstream. During a fluvial event, flood paths and levels could be altered and there could be an increased flood risk to the surrounding area. As such, flood compensation could also be required. Potential for flood paths and levels to be altered and increased flood risk to the surrounding area should a breach of the tidal flood defences occur (residual flood risk). Increased surface water run-off from new impermeable areas could result in higher flow if run-off is not appropriately attenuated. This, in turn, could increase flood risk in the area.	N/A	N/A
Decommissioning	Assumed similar to the construction phase.	N/A	N/A
Groundwater			
Construction	Leakage and spills from fuels, oils, chemicals, and concrete may result from groundwater and soil contamination during construction phase which also indirectly affects the watercourses via site run-off or directly affects the water features in the vicinity of site. Required dewatering during construction and excavation phase may potentially impact the groundwater quality, flow and levels from groundwater abstraction and associated discharges.	N/A	N/A

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
	Excavation and sub-surface structures could also impact the groundwater quality and in turn the watercourses within or near the site.		
Operation	The foundation and subsurface structures may impede or alter the groundwater flow regime which may result in groundwater mounding up the hydraulic gradient and reduced groundwater levels down the hydraulic gradient. Groundwater abstraction during operational phase may have a potential impact on groundwater resources. Potential impact on groundwater resources should an alternative water supply be required (i.e. groundwater abstraction). At present, water supply is anticipated to be sourced from mains water supply and the River Dee. Contaminants may migrate to non-contaminated soils, geology, and groundwater via the foundations of structures.	N/A	N/A
Decommissioning	Assumed similar to the construction phase.	N/A	N/A

12. Geology and Ground Conditions

12.1 Introduction

12.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on Geology and Ground Conditions, which focusses on, but is not limited to, geology, geological designated sites, agricultural soils, mineral resources, hydrogeology and land contamination. The geology and ground conditions assessment will consider any potential likely significant effects on receptors sensitive to land contamination, that may arise from the construction / decommissioning[218] and operation of the Proposed Development.

12.1.2 This chapter of the scoping report includes an overview of the environmental baseline conditions, it describes the methodology to be used within the assessment, and it indicates the anticipated key issues likely to be associated with the Proposed Development.

12.1.3 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report, and is also supported by the following figures:

- **Figure 12-1:** Geology and Ground Condition Areas; and
- **Figure 12-2:** Predictive Agricultural Land Classification (ALC) Map.

12.1.4 Groundwater, surface water and ecological receptors are discussed within this chapter as they will be assessed as potential receptors to any land contamination or pollution related impacts from construction / decommissioning and operation of the Proposed Development. However, groundwater and surface water as strategic resources and / or discharge points, hydrogeological response to dewatering, and flooding are considered in **Chapter 11: Water Environment and Flood Risk** and ecological receptors are considered in more detailed in **Chapter 9: Terrestrial and Aquatic Ecology**. Furthermore, the potential for the disturbance and redistribution of potentially contaminated in-river sediments will be discussed in **Chapter 14: Physical Processes**, and potential impacts of such sediments on in-river fauna is discussed in **Chapter 10: Marine Ecology**.

12.2 Legislation, Policy and Guidance

12.2.1 The assessment will be undertaken in accordance with EU Directives; national Acts, regulations, policy and guidance; and local policy, legislation and guidance. In Wales, a draft soil policy statement is currently under development. It sets out a vision for the sustainable use and management of agricultural soils for future generations. Some guidance in relation to soils has UK-wide applicability. Those documents considered relevant to this chapter are as follows:

[218] It is assumed that the environmental effects associated with construction and decommissioning of the Proposed Development are comparable and have therefore been assessed on this basis.

Retained European Directives

- Environmental Liability Directive (2004/35/EC)[219];
- WFD (2000/60/EC);
- The Groundwater Directive (2006/118/EC)[220]; and
- The EQS Directive (2008/105/EC)[221].

National legislation

- Environment Act 2021;
- Environmental Protection Act 1990 and Part 2A (the Contaminated Land Regime);
- Water Act 2003[222];
- Water Resources Act 1991;
- Building Act 1984[223] and The Building (Amendment) Regulations 2016[224];
- Environment Act 1995;
- Town and Country Planning Act (TCPA) 1990[225];
- The EPR 2016;
- The Hazardous Waste (England and Wales) (Amendment) Regulations 2016[226];
- The Contaminated Land (Wales) Regulations 2006[227];
- Contaminated Land Statutory Guidance for Wales 2012[228];
- The Environmental Damage (Prevention and Remediation) Regulations 2009[229]; and
- The Anti-Pollution Works Regulations 1999[230].

National Planning Policy

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);

[219] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage. *Official Journal* L143:56. Luxembourg: Publications Office of the European Union.
[220] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration. *Official Journal* L372:19. Luxembourg: Publications Office of the European Union.
[221] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council. *Official Journal* L348:84. Luxembourg: Publications Office of the European Union.
[222] *Water Act 2003* (c. 37). London: HMSO.
[223] *Building Act 1984* (c. 55). London: HMSO.
[224] *The Building (Amendment) Regulations 2016* (SI 2016/490). London: HMSO.
[225] *Town and Country Planning Act 1990* (c. 8). London: HMSO.
[226] *The Hazardous Waste (England and Wales) (Amendment) Regulations 2016* (SI 2016/336). London: HMSO.
[227] *The Contaminated Land (Wales) Regulations 2006* (SI 2006/2989 (W. 278)). London: HMSO.
[228] Welsh Government, 2012; *Contaminated Land Statutory Guidance for Wales* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2019-08/contaminated-land-statutory-guidance-2012.pdf.
[229] *The Environmental Damage (Prevention and Remediation) Regulations 2009* (SI 2009/153). London: HMSO.
[230] *The Anti-Pollution Works Regulation 1999* (SI 1999/1006). London: HMSO.

- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- PPW; and
- The NP.

Local Planning Policy

- FCC LDP.

Guidance/best practice

- Environment Agency's online guidance for the management of land contamination 'Land contamination: risk management' (LCRM), adopted by NRW in 2021[231];
- Welsh Land Contamination Working Group: The Development of Land Affected by Contamination: A Guide for Developers[232];
- BS 10175 (2011 + A2 2017), Investigation of Potentially Contaminated Sites - Code of Practice[233];
- BS 8576 (2013), Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)[234];
- BS 8485 (2019), Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings[235];
- CIRIA C665, Assessing risks posed by hazardous ground gases to buildings, 2007[236];
- CIRIA C811, Environmental good practice on site guide (fifth edition), 2023;
- Environment Agency 'Guidance Note on Piling/Penetrative Ground Improvement Methods on Land Affected by Contamination' NC/99/73, 2001[237];
- CDM Regulations 2015;
- DMRB, LA109 Geology and Soils (2019)[238];
- DMRB, LA104 Environmental assessment and monitoring (2020);
- DMRB, LA113 Road drainage and the water environment (2020);

[231] Environment Agency, 2023; *Land contamination risk management (LCRM)* [online]. Accessed November 2023. https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.
[232] Welsh Local Government Association and Environment Agency, 2012; *Development of Land Affected by Contamination: A Guide for Developers* [online]. Accessed November 2023. https://www.monmouthshire.gov.uk/app/uploads/2017/04/WLGAEAW-Guide-for-Developers-English-2012.pdf
[233] British Standard Institute, 2017; BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice.
[234] British Standard Institute, 2013; BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs).
[235] British Standard Institute, 2019; BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
[236] CIRIA, 2007; *Assessing risks posed by hazardous ground gases to buildings (C665)*. London: CIRIA.
[237] Environment Agency, 2001; *Guidance Note on Piling/Penetrative Ground Improvement Methods on Land Affected by Contamination NC/99/73*.
[238] Highways England (Welsh Government), 2019; Design Manual for Roads and Bridges (DMRB), LA109 Geology and Soils.

- National House Building Council (NHBC), Environment Agency report R&D66 'Guidance for the Safe Development of Housing on Land Affected by Contamination'[239];
- Agricultural Land Classification (ALC) of England and Wales[240];
- Construction Code of practice for the Sustainable Use of Soils on Construction Sites[241];
- A New Perspective on Land and Soil in Environmental Impact Assessment[242] (IEMA Land and Soil Guidance); and
- Good Practice Guide for Handling Soils in Mineral Workings[243].

12.3 Assumptions, Limitations and Uncertainties

12.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

12.3.2 The assessment will be based on the collation and evaluation of readily available documentation provided by the Environment Agency, BGS, historical reports for the Site and immediate surroundings, and other data sources made available.

12.3.3 The assessment should be read in light of the legislation, statutory requirements and/ or industry good practice applicable at the time of the assessment being undertaken. Any subsequent changes in this legislation, guidance or design may necessitate the findings to be reassessed in the light of these circumstances.

12.3.4 It is not anticipated that any upgrades to existing pipelines along the Existing Natural Gas Connection Corridor or the Repurposed CO_2 Connection Corridor, beyond the scope of routine maintenance, will be required during construction of the Proposed Development as described in **Chapter 3: The Proposed Development**. While an appropriate baseline for these aspects of the Proposed Development has been identified in Section 12.4, these aspects are not considered further within this assessment.

12.4 Baseline Conditions

Study Area

12.4.1 Impacts from the Proposed Development on soils, geological features, and Mineral Safeguarding Areas (MSA), will typically occur directly within the Site where construction / decommissioning activities would take place or interface directly with these receptors.

[239] NHBC, 2008; *Guidance for the Safe Development of Housing on Land Affected by Contamination* [online]. Available at: https://www.nhbc.co.uk/binaries/content/assets/nhbc/products-and-services/tech-advice-and-guidance/guidance-for-the-safe-development-of-housing-on-land-affected-by-contamination.pdf.
[240] Ministry of Agriculture, Fisheries and Food (MAFF), 1988; *Agricultural Land Classification (ALC) of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* [online]. Available at: http://publications.naturalengland.org.uk/publication/6257050620264448
[241] DEFRA, 2009; *Construction Code of practice for the Sustainable Use of Soils on Construction Sites* [online]. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69308/pb13298-code-of-practice-090910.pdf
[242] IEMA, 2022; *A New Perspective on Land and Soil in Environmental Impact Assessment*. March: IEMA.
[243] Institute of Quarrying, 2021; *Good Practice Guide for Handling Soils in Mineral Workings* [online]. Available at: https://www.quarrying.org/soils-guidance

12.4.2 Impacts to soils in relation to agricultural land only occur on the land that is directly impacted by the Proposed Development and hence a wider study area is not applied when describing and considering agricultural soils.

12.4.3 For the purposes of determining the wider geological context, geodiversity and to support the conceptual understanding of the ground model, the soils and geology baseline will consider an extended 250 m study area from the Proposed Development.

12.4.4 For the purposes of determining the local baseline conditions with respect to land contamination, a study area that also extends 250 m from the Site Boundary will be adopted. This will be extended for hydrogeology to 1 km from the Site Boundary. This is appropriate to assess the hydrogeological setting, and any influence that potential land contamination might have on the Proposed Development or local receptors (taking into consideration the pathways for contaminant migration). The study areas are presented in **Figure 12-1 (Appendix A)**.

12.4.5 The Water Connection Corridor partially extends into the Dee Estuary (referred to as in-river). For the in-river assessment, there will be no contaminated land sites (point sources) or soils, but geology within the Site will be a matter for consideration. The potential for the disturbance and redistribution of contaminated in-river sediments will be discussed in **Chapter 14: Physical Processes**, and potential impacts of such sediments on in-river fauna is discussed in **Chapter 10: Marine Ecology**.

Geology

12.4.6 Publicly available sources have been reviewed, including the BGS GeoIndex website, BGS Map Sheet 108 (Flint, 1:50,000 scale, Solid and Drift)[244] and selected historical borehole logs (from the GeoIndex website) to identify the ground conditions of the Site. A high-level review of the geology is reported in the following sections.

12.4.7 The bedrock geology in the region is complex, with the presence of numerous faults trending approximately north to south. For the purposes of this scoping chapter, the superficial and bedrock strata that outcrop at the surface or in the case of bedrock which subcrop beneath the superficial deposits have been identified. A detailed review of the geology in the area, including the sequence of strata, will be completed as part of the Phase 1 desk-based assessment to accompany the ES (see Section 12.5.3 for further details).

Main Site

12.4.8 Made ground is mapped across the vast majority of the Main Site.

12.4.9 The made ground is underlain by Tidal Flat Deposits (clay, silt and sand) across the entire area, with the exception of a limited area along the North Wales Main Line railway (located just south of the Main Site) where Till outcrops. The surroundings of the Main Site are directly underlain by discontinuous Till to the south and Tidal Flat Deposits to the east, west and north.

[244] BGS, 1999; Map Sheet 108, Flint, 1:50,000 scale, Solid and Drift, 1999. Accessed November 2023.

12.4.10 At the Main Site, the Superficial Deposits are underlain by the following strata (listed in age sequence from youngest to oldest):

- Etruria Formation (mudstone, sandstone and conglomerate) mapped in a north to south subcrop in the central / eastern portion of the Main Site. The subcrop extends further north and south of the Main Site;
- Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone) subcrop in the eastern and western portion of the Main Site, further extending to the east and north-east, and west and north-west of the Main Site; and
- Gwespyr Sandstone (sandstone and argillaceous rocks) mapped in a north to south subcrop in the central / western portion of the Main Site. The subcrop extends further north and south of the Main Site.

12.4.11 A borehole log from 1967[245] confirms the western portion of the Main Site to be underlain by a 1.8 m stratum of made ground consisting of fly ash overlying predominantly silt and sand up to 10 m below ground level (bgl). These overlie sandstone, siltstone, shale and mudstone to the maximum investigated depth of 70 m bgl. Similar ground conditions were encountered in the same year in a borehole drilled in the easternmost portion of the Main Site[246]; at this location, a band of coal was also encountered at a depth of approximately 30 m bgl (0.8 m thickness). Note that ground conditions are anticipated to have changed since 1967 due to the potential deposition of more PFA from continued operation of the coal site (see paragraph 12.4.59).

Proposed CO_2 Connection Corridor

12.4.12 No made ground is mapped within the Proposed CO_2 Connection Corridor; however, it is mapped immediately adjacent to the east (south of Little Leadbrook Farm).

12.4.13 The Proposed CO_2 Connection Corridor and its study area are indicated to be underlain by superficial Till, except for Glaciofluvial Deposits (sand and gravel) outcropping immediately east and an isolated area of Head deposits outcropping immediately north. The Glaciofluvial Deposits and Head deposits are potentially underlain by Till.

12.4.14 The bedrock geology comprises Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone) with the Gwespyr Formation and Pennine Lower Coal Measures Formation (sandstone) also subcropping within the study area to the south and north, respectively.

12.4.15 No suitable historic borehole logs are available to provide an indication of the ground conditions at the Proposed CO_2 Connection Corridor (the closest is located 220 m east and does not reach bedrock).

Repurposed CO_2 Connection Corridor

12.4.16 Made ground is mapped in only a limited area of the Repurposed CO_2 Connection Corridor; in proximity of the railway line that forms the northern boundary. Made ground is also expected within 250 m from the Repurposed CO_2 Connection Corridor adjacent to the east of the northern portion (around

[245] BGS Reference: SJ27SE23.
[246] BGS Reference: SJ27SE16.

Oakenholt Mill) and to the south of the southernmost extent (south of Little Leadbrook Farm).

12.4.17 Superficial deposits across the Repurposed CO_2 Connection Corridor and the study area mostly comprise Till. Tidal Flat Deposits outcrop in the northernmost extent. An isolated area of Head deposits outcrops in the study area, north of the southernmost extent; and Glaciofluvial Deposits (sand and gravel) outcrop to the south of the Repurposed CO_2 Connection Corridor. Occasionally, superficial deposits are absent (not mapped).

12.4.18 The bedrock geology comprises Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone) interbedded by subcrops of Gwespyr Sandstone (sandstone and argillaceous rocks) in the northern area, and Pennine Lower Coal Measures Formation (sandstone) in the central and southern areas.

12.4.19 No suitable historic borehole logs are available along the Repurposed CO_2 Connection Corridor. A borehole drilled in the study area, in proximity of Oakenholt Mill[247], shows the area to be underlain by a 0.60 m stratum of filled ground, overlying strata of sandstone, shale, ironstone, and grit with layers of coal.

Water Connection Corridor

12.4.20 Made ground is not mapped across the majority of the Water Connection Corridor; it is, however, mapped in the south-easternmost extent, and immediately south and south-west (within the Main Site).

12.4.21 Superficial deposits consist of Tidal Flat Deposits.

12.4.22 The bedrock geology comprises Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone), with Pennine Lower Coal Measures Formation (sandstone) also subcropping within the study area to the east and south-east.

12.4.23 A historic borehole log[248] located approximately 50 m off the north-eastern extent of the Water Connection Corridor encountered made ground, which included gravel size fragments of clinker up to the depth of 2.15 m bgl. This was underlain by sand (identified as Alluvium) overlying sand and gravel. Bedrock was encountered at 8.6 m bgl and consisted of sandstone with occasional layers of siltstone. The maximum investigated depth was 26.6 m bgl.

Electrical Connection Corridor

12.4.24 Made ground is mapped across the entire Electrical Connection Corridor.

12.4.25 Superficial deposits consist of Tidal Flat Deposits.

12.4.26 The bedrock geology comprises Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone in the western portion; and sandstone in the east).

[247] BGS Reference: SJ27SE2/B
[248] BGS Reference: SJ27SE302.

12.4.27 A historic borehole log in proximity of the Electrical Connection Corridor[249] indicated the presence of highly weathered mudstone from 7.3 m to 7.5 m bgl, followed by mudstone, interbedded by 'crush breccia' and fragmented coal. Sandstone and siltstone were also encountered from 13.5 m bgl to the maximum investigated depth of 25.25 m bgl. The borehole was drilled by open hole techniques (i.e. no sample recovery) from ground level to 7.3 m bgl which means no logging information is available.

Indicative Enhancement Area

12.4.28 Made ground is mapped across the Indicative Enhancement Area.

12.4.29 The made ground is underlain by Tidal Flat Deposits, with potential Till beneath. Further south, beyond the B5129, Till is also mapped.

12.4.30 The bedrock geology comprises the Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone). The Gwespyr Sandstone subcrops immediately south-east and the Pennine Lower Coal Measures Formation (sandstone) subcrop in the study area to the north-west.

12.4.31 According to available mapping, the Alternative Access to the Main Site and Access to the Indicative Enhancement Area are expected to be underlain by Tidal Flat Deposits (absent in some areas); however, made ground is likely to be present. Superficial deposits are underlain by bedrock geology of the Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone).

12.4.32 No publicly available historic borehole logs are available within the Indicative Enhancement Area. A borehole drilled approximately 70 m south-east[250] shows the area to be underlain by a 1.2 m thick layer of ash fill below a narrow stratum of topsoil and silt. Below the ash fill are sand and clay, followed by mudstone (encountered at 3.5 m bgl). The maximum investigated depth was 4 m bgl.

Existing Natural Gas Connection Corridor

12.4.33 Made ground is mapped across the northern half of the Existing Natural Gas Connection Corridor, and a small area in the southernmost extent.

12.4.34 The made ground is underlain by Tidal Flat Deposits.

12.4.35 The bedrock geology comprises the Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone) with the Gwespyr Sandstone subcropping in the northernmost extent of the Existing Natural Gas Connection Corridor and study area.

12.4.36 Historic borehole logs in the north of the Existing Natural Gas Connection Corridor [251] indicated the presence of sandstone, siltstone, coal, 'crush breccia' and clay, although thicknesses are not specified. The logs appear to be recorded from below 25 m bgl (therefore superficial thicknesses are unknown), and appear to terminate at approximately 90 m bgl.

[249] BGS Reference: SJ27SE303..
[250] BGS Reference: SJ27SE216.
[251] BGS Reference: SJ27SE288.

Geological Sites

12.4.37 Mapping available on Data Map Wales indicates no geological Sites of Special Scientific Interest (SSSI), Regionally Important Geodiversity Sites (RIGS) (which are now more commonly referred to as Local Geological Sites (LGS)), or Geological Conservation Review sites (GCR) are located within the study area.

Soils

12.4.38 The soil series are the base category of soil classification and are defined based upon particle-size distribution, parent material, colour and mineralogical characteristics. Related soil series are mapped as soil associations. Hard copy mapping suggests that 0711m Salop and 0711n Clifton are the principal soil associations present within the Site.

12.4.39 Information on soil associations is derived from Cranfield Environment Centre (CEC) Land Information System (LandIS). This is the most detailed available soils mapping covering England and Wales and is produced from survey data from the Soil Survey of England and Wales. Salop association occurs on the narrow coastal lowland of north Wales and consists mainly of stagnogley soils with slowly permeable subsoils in reddish drift mostly derived from Permo-Triassic rocks. There is a small proportion of stagnogleyic argillic brown earths. As there is little run-off on level or gently sloping land, these slowly permeable soils are seasonally waterlogged. The Clifton association consists of seasonally waterlogged soils developed in reddish fine loamy till and related glaciofluvial deposits. It is extensive south-west of the Dee Estuary.

12.4.40 Additionally, mapping is provided on the Cranfield University Soilscapes website. Soilscapes is a 1:250 000 scale, simplified soils dataset covering England and Wales to assist general understanding of soil types. It indicates that there are varying soil types across the Site and study area.

12.4.41 Soils at the Main Site, the Indicative Enhancement Area, the Electrical Connection Corridor and the onshore section of the Water Connection Corridor are mapped as Soilscape 21: "*Loamy and clayey soils of coastal flats with naturally high groundwater*".

12.4.42 Soils at the Existing and Proposed CO_2 Connection Corridors are indicated to be "*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*", with the exception of the north-west to south-east portion of the Repurposed CO_2 Connection Corridor which is mapped as "*Loamy and clayey soils of coastal flats with naturally high groundwater*". "*Freely draining slightly acid loamy soils*" are also mapped immediately south-east of the Repurposed CO_2 Connection Corridor.

Agricultural Land

12.4.43 ALC is the standard method for classifying the quality of agricultural land in England and Wales. Land is assessed according to its versatility, productivity and workability, based upon inter-related parameters including climate, relief, soil characteristics and drainage. These factors form the basis for classifying agricultural land into one of five grades (with Grade 3 land divided into Subgrades 3a and 3b), ranked from excellent (Grade 1) to very poor (Grade

5). Grades 1, 2 and Subgrade 3a are recognised as best and most versatile land (BMV).

12.4.44 In Wales, predictive ALC is available via Data Map Wales. **Figure 12-2 (Appendix A)** presents the Predictive ALC and the areas of each grade and subgrade calculated. The data suggests that urban land is the largest individual element (44.4 ha) of the Proposed Development. BMV Grade 2 (30.3 ha) and Subgrade 3a (18.3 ha) present the largest proportion of agricultural land. Small elements of non-BMV land Subgrade 3b (0.7 ha), Grade 5 (4.2 ha) and 1.0 ha of non-agricultural land (typically trees and hedgerows) make up the remaining area.

12.4.45 The Grade 2 land according to predictive ALC mapping is within the Main Site. The Subgrade 3a land dominates the Existing and Proposed CO_2 Connection Corridors.

Mineral Resources

12.4.46 According to the FCC LDP, no MSAs are located within the Site Boundary or within the study area, with the exception of an MSA that overlaps the south-eastern area of the Proposed CO_2 Connection Corridor and is adjacent to the southernmost spur of the Repurposed CO_2 Connection Corridor. The specific mineral was not identified in the LDP, although the MSA appears to be mapped in the region of the sand and gravel associated with the Glaciofluvial Deposits.

12.4.47 The Coal Authority Interactive Map[252] indicates that the Site is located within the Coal Mining Reporting Area. The area overlapping the northern portion of the Repurposed CO_2 Connection Corridor and south-west of the Main Site; Oakenholt, and in particular south of Oakenholt Mill, is reported to be a Development High Risk Area. Surface mining (past and current), past shallow coal mine workings and coal outcrops are mapped in this area, together with a number of mine entries and potentially abandoned mines.

Hydrogeology

12.4.48 The NRW and BGS aquifer classification, available on the GeoIndex website, indicates that the superficial deposits within 1 km from the Site (where present) are classified as:

- secondary (undifferentiated) aquifer (aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type) – Till, Head and Tidal Flat Deposits; and
- secondary A aquifer (aquifers comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers) – Glaciofluvial Deposits.

12.4.49 The aforementioned bedrock formations (listed in the Geology section of this chapter) are classified as Secondary A aquifers. The Bowland Shale Formation (Mudstone) (which is mapped approximately 500 m south of the Main Site and 1 km east of the Indicative Enhancement Area) is classified as a Secondary (undifferentiated) aquifer.

[252] The Coal Authority, 2023; *Interactive Map* [online]. Available at: https://mapapps2.bgs.ac.uk/coalauthority/home.html. Accessed November 2023.

12.4.50 According to Data Map Wales, there are no SPZ within 1 km of the Site.

12.4.51 A brief review of the aforementioned historical borehole logs (see the Geology section) has been undertaken to provide an indication of anticipated groundwater levels in the area. The groundwater table was generally found to be at shallow depths; within the Main Site, recorded water levels (before each day of rotary drilling) were between 0.6 m and 3.8 m bgl. In proximity of the Indicative Enhancement Area, water levels appear to be between 1.5 m and 3.5 m bgl. In proximity of the Water Connection Corridor, groundwater was encountered at 2.15 m bgl during drilling and then rose to 1.6 m bgl in 20 minutes.

Surface Water Features

12.4.52 The main surface water feature is the River Dee, a designated Main River which is part of the Dee Estuary at this location. The River Dee is located north-east of the Main Site and the Indicative Enhancement Area. The Water Connection Corridor is partially located in-river within the River Dee. For all other water features, see **Chapter 11: Water Environment and Flood Risk**, paragraph 11.4.11 and **Table 11-1**.

Ecological / Sensitive Sites

12.4.53 MAGIC Map indicates that the only designated site within 250 m from the Site is the Dee Estuary (Aber Dyfrdwy), classified as an SSSI, Ramsar Site, SAC, and SPA.

12.4.54 The Dee Estuary is adjacent to the north of the Main Site, the Electrical Connection Corridor, the Repurposed CO_2 Connection Corridor, and the Indicative Enhancement Area, and it overlaps the Access to Wildlife Hides, the Water Connection Corridor and the southern extent of the Existing Natural Gas Connection Corridor.

Land Contamination

12.4.55 The historical use of the Site and surrounding area has been evaluated using freely available historical maps, internet research and a brief overview of the RPS Contaminated Land Due Diligence report (dated July 2015)[253], hereafter referred to as the 'RPS report'. Historical land use has the potential to have caused a legacy of contamination which may pose a risk to the Proposed Development or surrounding sensitive receptors during construction / decommissioning and operation. A high-level review has been carried out in order to understand whether land contamination should be scoped in or out of the ES. Further review will be undertaken as part of the ES.

12.4.56 Further review of the RPS report will also be undertaken as part of the Phase 1 desk-based assessment (see Section 0 for details).

Main Site

12.4.57 According to the earliest available mapping (c. 1888) held by Historic Wales[254], the Main Site was predominantly occupied by areas regularly

[253] RPS, 2015; *Contaminated Land Due Diligence, Connah's Quay Power Station Summary Report*.
[254] Historic Wales, 2023; *Historic Wales Portal* [online]. Available at: https://historic-wales-rcahmw.hub.arcgis.com/. Accessed November 2023.

covered by the tide, sand and mud. The railway line, located immediately south of the Main Site and the Indicative Enhancement Area, was already present. Other notable elements within 250 m from the Main Site, all located south of the railway line, are a coal pit, a brewery, farms and Oakenholt Mill with associated reservoir; this is located approximately 200 m west.

12.4.58 Publicly available photographs on Google Earth Pro were also reviewed. The photograph dated 1945[255] shows the Main Site as mostly undeveloped and as saltings / marshland. The railway line is visible, with sporadic settlements along the route.

12.4.59 The RPS report indicates that reclamation of the Main Site began in 1950, with land raising / reclamation activities (up to 2 m high) using PFA from the then active coal-fired power station that was located in the Indicative Enhancement Area. Built development was progressed in the form of a 'works' in the Main Site area in the 1950s, with an electrical substation added in the 1980s.

12.4.60 The Connah's Quay gas-fired Power Station was built within the Main Site area between 1993 and 1995 and was first shown on 2002 map editions. It comprises cooling water abstraction and discharge points in the River Dee, settlements ponds, cooling towers, water treatment plant, turbo generators and associated infrastructure.

12.4.61 The coal-fired station ceased operations in 1984 and demolition started in 1992.

12.4.62 The Google Earth Pro photograph dated 2006[256] shows the Connah's Quay Power Station on the Main Site largely in its current configuration. Areas south of the railway line, and south-west of the Main Site (near Oakenholt) were redeveloped into commercial / industrial activities, including Oakenholt Mill, which appears to be still used for the production of pulp (Essity Products[257]), a courier service, and concrete manufacturing. No significant changes are visible between 2006 and the latest available image dated 2022[258].

12.4.63 Data Map Wales reports two historical landfill sites in the western portion of the Main Site; both are associated with the Connah's Quay Power Station operations, with further information as follows:

- Connah's Quay Power Station 3, "ash lagoon". Operator: Central Electricity Generating Board. Contains inert and industrial waste. First input: December 1962. Last input: not provided.
- Connah's Quay Power Station. Operator: Central Electricity Generating Board. Site reference: A/L/10/11/B/RD/7/10. Contains inert, commercial and industrial waste. First input: May 1977. Last input: September 1991.

12.4.64 The Oakenholt Household Waste Recycling Centre is also located immediately south of the railway line, south of the Main Site.

[255] Google Earth Pro 7.3.6.9345 (2022); Connah's Quay 53°13'52"27"N 3° 4'55"47"W Eye alt 2.60 km. The GeoInformation Group – Image NASA. Accessed November 2023.
[256] Google Earth Pro 7.3.6.9345 (2022); Connah's Quay 53°13'54"61"N 3° 4'57"00"W Eye alt 2.66 km. Bluesky, Infoterra Ltd & COWI A/S
[257] Essity, 2023; *Manufacturing sites and offices* [online]. Available at: https://www.essity.com/company/essity-in-the-world/uk-roi/manufacturing-sites-in-uk-roi/. Accessed November 2023.
[258] Google Earth Pro 7.3.6.9345 (2022); Connah's Quay 53°13'53"82"N 3 3° 4'42"95"W Eye alt 2.60 km.

Proposed CO_2 Connection Corridor

12.4.65 Historical aerial photographs held by Historic Wales indicate the area to have mostly been used as agricultural land in the earliest available image (approximately 1888). A small structure or pond is visible within the Proposed CO_2 Connection Corridor boundary. In the next available photograph, dated 1945[259], the area is still agricultural land; a potential quarry is visible approximately 100 m east. Sporadic settlements (likely farms) are also located within 250 m. The quarry appears to have been infilled in the following photograph (2006). No significant changes are observed between 2006[260] and 2022[261].

Repurposed CO_2 Connection Corridor

12.4.66 The Repurposed CO_2 Connection Corridor was mostly agricultural land from the earliest available photograph to recent times, with the exception of the northern portion which includes the railway line. Part of the commercial / industrial area around Oakenholt (see paragraph 12.4.62) is also within the Repurposed CO_2 Connection Corridor and study area, including Oakenholt Mill.

12.4.67 The Repurposed CO_2 Connection Corridor is adjacent to the south of two historic landfill sites and west of the Recycling Centre described in paragraphs 12.4.63 and 12.4.64. A historic landfill is also located to the north-west of the Repurposed CO_2 Connection Corridor; this is named as J and J Makin, and accepted industrial, commercial and household waste. The last input was in December 1969.

Water Connection Corridor and Electrical Connection Corridor

12.4.68 Similar to the Main Site, the onshore portion of the Water Connection Corridor and the Electrical Connection Corridor were predominantly occupied by saltings until reclamation in the 1950s. On the Historic Wales map dated 1888, a rifle range is noted to be mapped approximately 170 m south of the Electrical Connection Corridor. The rifle range is not visible in the aerial photographs from 1945 and 2006.

12.4.69 Structures within these areas appear to be in their current configuration only since 2019[262], when the National Grid substation and associated infrastructure were completed.

12.4.70 Data Map Wales reports an historical landfill site in the study area to the north-east of the Water Connection Corridor, beyond the River Dee; this is named as ‘Shotton Works - area on north-west side of interconnecting road / Shotton Works’ and was operated by British Steel Plc. It accepted inert, household, and liquid sludge waste and is subject to gas and leachate controls. The first input was in December 1945 and the last input was December 1995.

[259] Google Earth Pro 7.3.6.9345 (2022); Oakenholt 53’13'59”24" 3’ 6'39”19"W Eye alt 1.73 m. The GeoInformation Group Image NASA. Accessed November 2023
[260] Google Earth Pro 7.3.6.9345 (2022); Oakenholt 53’13'59”24" 3’ 6'39”19"W Eye alt 1.73 m. 2023 Bluesky, Infoterra Ltd & COWI A/S. Accessed November 2023
[261] Google Earth Pro 7.3.6.9345 (2022); Oakenholt 53’13'59”24" 3’ 6'39”19"W Eye alt 1.73 m. Maxar Technologies. Accessed November 2023
[262] Google Earth Pro 7.3.6.9345 (2022); Connah’s Quay 53’13'48”63"N 3’ 4'29”82"W Eye alt 1.76 km. Accessed November 2023

12.4.71 Data Map Wales reports an historical landfill site in the eastern portion of the Electrical Connection Corridor; this is named as Connah's Quay Power Station No.1 “ash lagoon” and was operated by the Central Electricity Generating Board. It accepted inert and industrial waste. The first input was in December 1954.

Indicative Enhancement Area

12.4.72 According to the earliest available mapping (c. 1888) held by Historic Wales, the Indicative Enhancement Area was predominantly occupied by areas regularly covered by the tide, sand and mud. A rifle range is also mapped within, or in close proximity to, the Indicative Enhancement Area. The railway line immediately south of the Indicative Enhancement Area was already present. Other notable elements within 250 m are a quarry and the town of Connah’s Quay, including its port approximately 250 m south-east.

12.4.73 Publicly available photographs on Google Earth Pro were also reviewed. The photograph dated 1945 shows the Indicative Enhancement Area as undeveloped and as saltings / marshland. The railway line is visible, with the town of Connah’s Quay extending south-east of the Indicative Enhancement Area.

12.4.74 The RPS report indicates that reclamation at the Indicative Enhancement Area began in 1950, with the dredging and pumping of sand from the Dee Estuary to lift the site ground level for the construction of the original coal-fired power station together with cooling towers. Following demolition in 1992, the Indicative Enhancement Area was cleared of all standing structures. Subsurface holes and pits were filled in with crushed materials from the demolition of the former Connah’s Quay Power Station. Since demolition, the Indicative Enhancement Area has remained mainly undeveloped except for a separate electrical substation that was constructed to the north of the Indicative Enhancement Area in the 1970s.

12.4.75 It is understood that asbestos (originating from the original coal-fired power station) has been buried within the Indicative Enhancement Area. This is managed by Uniper.

12.4.76 The Google Earth Pro photograph dated 2006 shows the Indicative Enhancement Area as undeveloped; however, footprints of demolished structures are still visible. The substation is visible to the north-east. No significant changes are visible between 2006 and 2022.

12.4.77 Data Map Wales reports two historical landfill sites within the study area of the Indicative Enhancement Area, with further information as follows:

- the Connah's Quay Power Station No.1 “ash lagoon” (described in paragraph 12.4.71) is located approximately 100 m west of the Indicative Enhancement Area.
- Shotton Works historical landfill is located approximately 210 m north-east of the Indicative Enhancement Area. The license holder was Corus UK Limited. It accepted industrial and household waste. The last input was in December 1995.

12.4.78 A petrol filling station is located approximately 100 m south-east of the Indicative Enhancement Area, along the B5129.

Existing Natural Gas Connection Corridor

12.4.79 According to the earliest available mapping (c. 1888) held by Historic Wales, the Existing Natural Gas Connection Corridor was predominantly occupied by areas regularly covered by the tide, sand and mud (White Sands).

12.4.80 The Google Earth Pro photograph dated 2006 shows the southern area of the Existing Natural Gas Connection Corridor as potential worked ground, similarly to the configuration on current aerial mapping (although with less vegetation).

12.4.81 Data Map Wales reports two historical landfill sites within the study area of the Existing Natural Gas Connection Corridor, with further information as follows:

- Broken Bank Tip (Shotton Steelworks) is located in the northern extent of the Existing Natural Gas Connection Corridor. The license holder was British Steel. It accepted industrial waste. The first input was July 1977 and the last input was in March 1994.
- Shotton Works – Area on North West Side historical landfill is located in the southern extent of the Existing Natural Gas Connection Corridor. The license holder was British Steel. It accepted inert, industrial, liquid sludge and household waste. The first input was December 1945 and the last input was in December 1995.

Outline Conceptual Site Model

12.4.82 The following potential sources of contamination have been identified within the Site Boundary and its study area:

- former coal-fired and current gas-fired Connah's Quay Power Station and associated infrastructure, including substations;
- industrial land use (e.g. Oakenholt Mill (paper / pulp));
- made ground associated with reclamation, infilled quarries and existing and past infrastructure;
- railway land;
- agricultural land and farms;
- potential shallow coal mining;
- petrol filling station along B5129; and
- deposited waste within historic landfills, including ash lagoons, inert, industrial, household, commercial and liquid sludge.

12.4.83 In terms of sensitive receptors surrounding the Site, these can be divided into controlled waters, human health, development infrastructure and ecological / geological designated sites:

- controlled waters receptors including:
  - Surface water features (including River Dee, Lead Brook, Kelsterton Brook and other unnamed water features); and
  - The underlying groundwater aquifers including the Secondary A and Secondary (undifferentiated) superficial and bedrock aquifers.

- human health receptors including:
  - nearby residents, commercial and industrial workers;
  - future site staff and maintenance workers; and
  - construction / maintenance workers undertaking the site works.
- future and current development infrastructure, including foundations, pipelines and services.
- ecological sites including Dee Estuary, classified as a Ramsar Site, SSSI, SAC, SPA.

12.4.84 The following potential pathways are considered to be present:

- direct contact, dermal absorption or ingestion of contaminated soil;
- inhalation of soil particulates derived from soils and inhalation of soil vapour derived from soils / groundwater;
- migration of hazardous gases / vapours via permeable strata into confined spaces (asphyxiation / explosion);
- leaching of chemicals and vertical migration via permeable unsaturated strata to the shallow aquifer and vertical migration of impacted shallow groundwater to the deeper aquifer;
- spillage / loss / run-off from surface water to receiving water features;
- lateral migration of impacted shallow groundwater towards surface water baseflow;
- migration via underground utilities to surface water; and
- contact of services and concrete with contaminated soils and aggressive ground conditions.

12.5 Impact Assessment Methodology

Consultation

12.5.1 No engagement has been undertaken to date with respect to information requests (such as pollution incidents, water abstractions, landfill information, for example) or the scope or assessment methodology for this chapter; however, the following statutory bodies will be consulted prior to completing the assessment:

- NRW;
- FCC;
- site operator;
- the Coal Authority; and
- local geology groups (where relevant).

Study Area

12.5.2 The applicable study area that will be used to establish the baseline is the same as that detailed within paragraphs 12.4.1 to 12.4.5 as shown on **Figure 12-1 (Appendix A)**.

Establishing the Baseline

12.5.3 A Phase 1 desk-based assessment (equivalent to a Stage 1, Tier 1 assessment as defined under LCRM, adopted by NRW in 2021) will be completed to identify and provide an assessment of any potential hazards and constraints to the Proposed Development deriving from the ground conditions, including the potential for land contamination, an outline of the ground hazards and a preliminary risk from unexploded ordnance (UXO)[263]. A site walkover will also be completed within key, high-risk areas, and a summary provided. The Phase 1 desk-based assessment will include a ground model based on available geological and hydrogeological information. This will inform a preliminary Conceptual Site Model (CSM) that will identify the potential for land contamination and potential contaminant pathways to impact sensitive receptors and consider the mobilisation of contaminants associated with current and historical land use in and around the Proposed Development.

12.5.4 The results of the desk-based assessment and preliminary CSM will be used to assess data gaps and uncertainties and, if required, develop an initial scope for site investigation in order to quantitatively assess the levels of contamination across the Proposed Development. Ground investigation would be intended to support the development of the design, confirm the ground model and also to quantitatively assess any potential land contamination risk to the Proposed Development. This tiered approach to assessment is consistent with the Environment Agency LCRM guidance. It is anticipated that the requirements for any intrusive investigation will be discussed and agreed in advance with NRW and relevant Local Authorities.

Sources of Information

12.5.5 Relevant existing reports will be reviewed to inform the baseline conditions for the Phase 1 report and the ES chapter. These will include, but are not limited to:

- Connah’s Quay Hydrogen – North Site Evaluation Report, January 2022;
- Connah's Quay CCGT Banking Compound Site Investigation. 1994[264];
- Ground Investigation No. V0404 Factual and Interpretative Report Connah’s Quay Power Station. 2007[265];
- Remediation of Connah’s Quay A Power Station UTG/20/ECP/PB/871/R. 2020[266];

[263] The preliminary risk will not conclude the risk level, but will advise on required further research.
[264] Civil Engineering Centre Geotechnical Group (Harvey, J), 1994; *Connah's Quay CCGT Banking Compound Site Investigation*.
[265] C. J. Associates Geotechnical Limited (Leat, S), 2007; *Ground Investigation No. V0404 Factual and Interpretative Report Connah’s Quay Power Station*.
[266] Uniper Technologies Ltd. (Dallyn, P), 2020; *Remediation of Connah’s Quay A Power Station UTG/20/ECP/PB/871/R*.

- Contaminated Land Due Diligence – Connah's Quay Power Station Summary Report, July 2015;
- other reports relevant to ground conditions made available by the Applicant; and
- relevant design information made available by the Applicant.

12.5.6 An assessment of potential impacts on existing ground conditions will be undertaken as part of the EIA, including the potential for the Proposed Development to result in land contamination, as defined in the Part 2A of the Environmental Protection Act 1990. Consideration will also be given to potential impacts associated with the construction / decommissioning and operation of the Proposed Development and how these will be prevented or minimised.

12.5.7 Predictive ALC mapping presents a likely worst-case for BMV land. An ALC survey is recommended to accurately determine the grading

Geology, Minerals and Agricultural Soils Impact Assessment Methodology

12.5.8 The likely significance of effects of the construction / decommissioning and operational stages to geology, mineral resources, and agricultural soil will be assessed based on the sensitivity or importance of the resource and the magnitude of potential impact.

Contaminated Land Impact Assessment Methodology

12.5.9 The approach to assessing the potential impacts of the Proposed Development from, and to land contamination, will be undertaken following a risk-based approach which is consistent with LCRM. The assessment will be based on comparing the risk levels at baseline via the preliminary CSM (developed in the Phase 1 desk-based assessment) and the assessed risk levels for the construction / decommissioning and operational stages respectively, to evaluate the change in risk at each stage. Potential risks are evaluated and assessed based on the likelihood (or probability) and consequence using the principles given in the NHBC and Environment Agency report R&D66 and LCRM. This provides guidance on development and application of the consequence and probability matrix to risk assessment and broad definitions of consequence and is widely used for a range of developments.

12.5.10 The significance of the effects of land contamination is assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and operation stages. Where there is shown to be a decrease in contamination risk, the Proposed Development is assessed as having a beneficial effect on the environment. Reference will be made to DMRB LA109, LA104 and LA113, which although applicable to road schemes, is considered to provide a suitable framework within which to conduct EIA for ground conditions on schemes which include linear elements (including the Proposed Development).

Soil and Agricultural Land Assessment Methodology

12.5.11 The impacts to soils and agricultural land would be assessed for the construction phase of the development. For the purposes of the assessment, it is assumed that the principal construction site is permanent development. It is assumed that construction within the Proposed CO_2 Connection Corridor is temporary and that the soils will be reinstated, and agricultural use resumed.

12.5.12 There would be no disturbance within the Repurposed CO_2 Connection Corridor. Disturbance within the Proposed CO_2 Connection Corridor would be temporary, with impacts on disturbed soils controlled through a Framework CEMP and an assumption that soils would be reinstated with original ALC grading maintained such that the land available can resume its original agricultural use. A Framework CEMP would be provided with the Application, with the commitments on soil management/ BMV land within the final CEMP secured by the DCO.

Hydrogeological Assessment

12.5.13 The initial hydrogeological baseline and proposed scope of assessment of potential impacts from the Proposed Development on groundwater is provided in **Chapter 11: Water Environment and Flood Risk**. At this stage, a qualitative impact assessment is proposed based on a source-pathway-receptor approach. This will consider the pollution risk to groundwater during construction/decommissioning and operation of the Proposed Development, as well as potential impacts on groundwater levels and flows from any deep excavations that may be required. Groundwater Dependent Terrestrial Ecosystems (GWDTE) will also be considered where relevant to do so. The scope of assessment will be kept under review as additional scheme information becomes available.

Assessment Criteria

12.5.14 Definitions of magnitude of impact, sensitivity or importance of the receptor and significance of effect that will be used in the ES are reported in the following section.

12.5.15 The magnitude of impact or how considerable the change to ground conditions is in comparison to the baseline conditions as a result of the construction / decommissioning and operation of the Proposed Development is classified as either being:

- high adverse or beneficial;
- medium adverse or beneficial;
- low adverse or beneficial; or
- very low adverse or beneficial.

12.5.16 The criteria and their respective magnitude of impact classification which has been applied are presented within **Table 12-1** and based on the DMRB LA109 and LA113 (adapted in the case of soils to align with the sensitivity criteria within the IEMA guidance).

Table 12-1 Magnitude of impact and descriptions

	Definition	Demonstrated in the construction and operation CSM as risk level changes defined as follows
High	**Geology and Mineral Resources** Loss of geological feature / designation and / or quality and integrity, severe damage to key characteristics, features, or elements. **Soils** Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over >20 ha of agricultural land.	Not applicable
	Contamination 1) human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (category 4 screening levels) within SP1010[267] with potential for significant harm to human health. Contamination heavily restricts future use of land; 2) surface water: refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Large adverse**: An increase in contamination risk of 4 or 5 risk levels in the risk matrix, e.g. land that has a very low contamination risk in the baseline becoming a high or very high risk. **Large beneficial**: A reduction in contamination risk of 4 or 5 risk levels in the risk matrix, e.g. land that has a very high contamination risk in the baseline becomes a low or very low risk.
Medium	**Geology and Mineral Resources** Partial loss of geological feature / designation, potentially adversely affecting the integrity; partial loss of / damage to key characteristics, features, or elements. **Soils** Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over >5 ha <20 ha of agricultural land.	Not applicable
	Contamination 1) human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (category 4 screening levels) in SP1010. Significant contamination can be present. Control / remediation measures are required to reduce risks to human health / make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Medium adverse**: An increase in contamination risk of 2 or 3 risk levels in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate or high risk. **Medium beneficial**: A reduction in contamination risk of 2 or 3 levels in the risk matrix, e.g. land that has a high contamination risk in the baseline becomes a moderate / low or low risk.
Low	**Geology and Mineral Resources** Minor measurable change in geological feature / designation attributes, quality, or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features, or elements.	Not applicable

[267] Contaminated Land: Applications in real environments (CL:AIRE), 2014;. *SP1010 Development of category 4 screening levels for assessment of land affected by contamination*. Reading: CL:AIRE.

	Definition	Demonstrated in the construction and operation CSM as risk level changes defined as follows
	Soils Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over <5 ha Temporary loss/ reduction of one or more soil function(s) and restriction to current or approved future use (e.g., through degradation, compaction, erosion of soil resource.).	
	Contamination 1) human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (category 4 screening levels) in SP1010. Significant contamination can be present. Control / remediation measures are required to reduce risks to human health / make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Small adverse**: An increase in contamination risk of 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate / low risk. **Small beneficial**: A reduction in contamination risk of 1 risk level in the risk matrix, e.g. land that has a moderate / low contamination risk in the baseline becomes a low risk.
Very low	**Geology and Mineral Resources** Minor measurable change in geological feature / designation attributes, quality, or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features, or elements. **Soils** No discernible loss/ reduction of soil function(s) that restrict current or approved future use.	Not applicable
	Contamination 1) human health: contaminant concentrations substantially below levels outlined in relevant screening criteria (category 4 screening levels) in SP1010. No requirement for control measures to reduce risks to human health / make land suitable for intended use; 2) surface water; refer to sensitivity criteria in LA113; and 3) groundwater: refer to sensitivity criteria in LA113.	**Negligible adverse**: An increase in contamination risk of none or 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate / low risk, but only slightly worse. **Negligible beneficial**: A reduction in contamination risk of none or 1 risk level in the risk matrix, e.g. land that has a moderate / low contamination risk in the baseline becomes a low risk, but only slightly better.

12.5.17 The criteria for assessing receptor sensitivity are defined in **Table 12-2** based on the DMRB LA109 and LA113 (which for soils align with the sensitivity criteria within the IEMA guidance).

Table 12-2 Receptor sensitivity

Sensitivity / value	Description / criteria
High	**Geology** Very rare and of international importance with no potential for replacement (e.g. United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage

	Sites, UNESCO Global Geoparks, SSSI and Geological Conservation Review (GCR) sites where citations indicate features of international importance). Geology meeting international designation citation criteria which is not designated as such. **Mineral resources[1]** Presence of significant mineral reserves and within a Mineral Buffer Zone or Safeguarding Zone. **Soils** Soils directly supporting an EU designated site (e.g. SAC, SPA, Ramsar). ALC grade 1 & 2 **Contamination** Human health: • Very high sensitivity land use such as residential or allotments. Surface water: • Watercourse having a WFD classification shown in a RBMP and Q95 ≥ 1.0 m^3/s. • Site protected / designated under EC or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water). • Species protected by EU legislation Ecology and Nature Conservation. Groundwater: • Principal aquifer providing a regionally important resource and / or supporting a site protected under EU and UK legislation Ecology and Nature Conservation. • Groundwater locally supports GWDTE. • SPZ 1.
Medium	**Geology** Rare and of national importance with little potential for replacement (e.g. geological SSSI, National Nature Reserves (NNR)). Geology meeting national designation citation criteria which is not designated as such. **Mineral resources[1]** Within a Mineral Consultation or Safeguarding Zone. **Soils** Soils directly supporting a UK designated site (e.g. SSSI). ALC Subgrade 3a Additional sensitivity criteria based on susceptibility of soils to damage when being handled (not the importance of the land for agriculture) can additionally be applied, if appropriate, based on IEMA guidance, reflecting combinations of soil texture, field capacity days and wetness class (for high, medium and low sensitivity classes only). **Contamination** Human health: • High sensitivity land use such as public open space. Surface water: • Watercourse having a WFD classification shown in a RBMP and Q95 <1.0 m^3/s. • Species protected under EU or UK legislation Ecology and Nature Conservation. Groundwater: • Principal aquifer providing locally important resource or supporting a river ecosystem. • Groundwater supports a GWDTE. • SPZ 2.
Low	**Geology** Of regional importance with limited potential for replacement (e.g. RIGS). Geology meeting regional designation citation criteria which is not designated as such. **Mineral resources[1]** Some mineral potential but not within a Mineral Consultation or Safeguarding Zone. Soils Soils supporting non-statutory designated sites (e.g. LWS, LNR, LGSs, Sites of Nature Conservation Importance (SNCI)).

	ALC Subgrade 3b Contamination Human health: • Medium sensitivity land use such as commercial or industrial. Surface water: • Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001 m^3/s. Groundwater: • Aquifer providing water for agricultural or industrial use with limited connection to surface water. • SPZ 3.
Very low	**Geology** Of local importance / little or low interest with potential for replacement (e.g. non-designated geological exposures, former quarries / mining sites). **Mineral resources**[1] Limited potential for mineral reserves and site not within a Mineral Consultation or Safeguarding Zone. **Soils** Soils supporting non-designated notable or priority habitats. ALC Grade 4 & 5 Previously developed land formerly in 'hard uses' with little potential to return to agriculture. **Contamination** Human health: • Low sensitivity land use such as highways and rail. Surface water: • Watercourses not having a WFD classification shown in a RBMP and Q95 ≤0.001 m^3/s. Groundwater: • Unproductive strata.

[1] Sensitivity of mineral receptors is not described as part of the referenced DMRB guidance. Therefore, professional judgement has been used.

12.5.18 The classification and likely significance of the effect resulting from the magnitude of impact and receptor sensitivity will be evaluated in accordance with the matrix shown in **Table 12-3**.

Table 12-3 Significance Matrix

Receptor sensitivity / value	Magnitude of Impact: High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

12.5.19 As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not

significant. Professional judgement will also be applied in reaching conclusions as to the likely significance of effects.

12.6 Embedded Mitigation

12.6.1 Based on the assessment of the baseline conditions and the identification of any potential impacts, recommendations for/ commitments to mitigation measures will be made, where relevant, in the ES. These may include the recommendation for an initial intrusive investigation (to address residual data gaps or better delineate identified potential contaminant linkages), quantitative risk assessment, remediation and validation, secured via the DCO.

12.6.2 Recommendations for/ commitments to mitigation measures to be employed by contractors, should any previously unidentified contamination be encountered during the construction phase will also be made, to be secured via the DCO. For example, in the event that unacceptable risks are identified or encountered during construction, and routing through these areas is unavoidable, remedial measures will be implemented.

12.6.3 If present, important geological features or resources will be considered within the design of the Proposed Development. The establishment of baseline conditions has been included to date and will continue to include a desk study and engagement / information from stakeholders.

12.6.4 The main mitigation measure to control potential adverse effects on soils, geology and hydrogeology during the construction phase of the Proposed Development will be to incorporate good site practice and management through the development and adherence to a CEMP and Soil Management Plan (SMP). The Environmental Permit required to operate the site will control releases to land and water. A Decommissioning Environmental Management Plan (DEMP) will control effects of final decommissioning.

12.6.5 The potential for mobilising fine sediment (and any contamination) into the water column in the estuary is likely to be controlled by a Deemed Marine License (see **Chapter 14: Physical Processes**).

12.6.6 Appropriate mitigation measures in relation to hydrogeological receptors will be identified in **Chapter 11: Water Environment and Flood Risk**, which may include measures such as an appropriate dewatering scheme to be developed prior to construction to demonstrate that there is an effective strategy to manage water arising from the construction operations and, where required, sufficient proposals to treat the water prior to controlled discharge.

12.7 Potential Effects

Ground disturbance sources

12.7.1 In the event of ground disturbance occurring, there is the potential for construction / decommissioning and future operations to adversely impact geological receptors. Construction and decommissioning activities can also result in physical damage to soil, including soil compaction as a result of heavy construction vehicle movements or the exacerbation of soil erosion through handling and storage of soils. Furthermore, during dewatering which

may be required as part of the construction / decommissioning phases, there may be a potential reduction of flow to surface water bodies and change in hydrogeological and hydrological setting locally.

12.7.2 A Framework SMP will be produced alongside the Framework CEMP and a final CEMP/ SMP will be secured via the DCO. The final CEMP/ SMP will be live documents with detail developed by the appointed contractor once construction methods are known. Within the Proposed CO_2 Connection Corridor, the SMP will describe the mitigation measures that follow good practice when working with soils to minimise risk of damage to soil structure and minimise the risk of contamination through poor sediment management from exposed soils.

Land contamination sources

12.7.3 In the locations of the identified potentially contaminative land uses, there is the potential for construction / decommissioning and future operations to impact on human health, controlled waters, buildings and infrastructure, and ecological receptors, where present.

12.7.4 It is anticipated (prior to the full risk and impact assessment, as detailed in paragraph 12.5.9), that there may be some potential for likely adverse effects during the construction / decommissioning phases, particularly in areas where significant contamination may be encountered, such as Connah's Quay Power Station and areas of historic landfills. Further assessment would be undertaken to evaluate whether these could be likely significant effects, or if they could be mitigated by the embedded and good practice measures.

12.7.5 During the post-construction / operation phase, it is anticipated that if any remediation is required and completed on potentially contaminated areas identified within the Site, there will, in most instances, be overall beneficial effects, which may be assessed as likely to be significant. If required, and subject to the results of initial ground investigation, site-specific permanent remediation measures, which focus on source removal, pathway breakage or receptor protection, will be developed during the detailed design stage. Such measures will be designed to reduce risks to human health, controlled waters, ecological receptors, and property from contamination, gas and vapours in the ground, to an acceptable level. Any remediation works undertaken prior to construction of the Proposed Development would be expected to result in a beneficial effect on the local environment.

12.7.6 It is anticipated that there will be no significant adverse effects during the operation of the Proposed Development caused by land contamination as maintenance and operation of the Proposed Development will be in accordance with all relevant environmental legislation and good practice including the Environmental Permit. Therefore, impacts from the operation phase are proposed to be scoped out of the assessment.

12.7.7 The potential for adverse effects on minerals, geology and soils caused by sterilisation of the resource and / or loss of geological features / significance during operation will be considered in the ES.

12.8 Additional Mitigation

12.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

12.9 Summary of Potential Likely Significant Effects

12.9.1 A summary of the potential effects to be considered in the ES is presented in **Table 12-4**.

Table 12-4 Summary of the Potential Likely Significant Effects to be Considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Geology and Ground Conditions			
Construction	Damage, disturbance or removal of geological features of interest (RIGS / LGS and GCR). Note that although none have been identified within the Site and study area on Data Map Wales, stakeholder correspondence will be required to confirm their absence prior to scoping out. Temporary compaction and degradation of soils. Removal of soils from agricultural production. Temporary mineral severance or sterilisation. Potential reduction of flow to surface water bodies and change in hydrogeological and hydrological setting locally. Mobilisation and migration of contamination to unsaturated soils, groundwater and surface water courses. Potential impacts on groundwater as a pathway may be created for drilling fluids or other fluids to reach sensitive groundwater receptors. Potential for contaminants in unsaturated soils to be exposed to surface water run-off and to leach to groundwater in open excavations. Potential impacts from migration of contaminants from uncovered stockpiles to surface water and groundwater receptors. Creation of preferential pathways for the migration of soil contamination and gases. Migration of contamination to unsaturated soils, surface water and groundwater. Potential impacts on groundwater from construction of underground structures / piling. Impacts from potential contamination in dust and fine particulate matter may impact ecological receptors. Impacts on human health from contamination within unsaturated soil (dust and fine particulate matter) and groundwater.	The areas of the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor.	No construction or maintenance works are anticipated to be required to the existing pipelines excluding minor maintenance/upgrade works to be carried out from AGIs.

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
	The disturbance or mobilisation of existing contamination towards buildings or service pipelines on-site or off-site may result in damage or deterioration and potential permeation of drinking water pipes by contaminants, due to aggressive conditions caused by the contaminants present or through the introduction of fill materials (lowering pH).		
Post-construction / post-decommissioning	Any contamination removed, remediated, or mitigated leading to removal of contaminant sources from the source – pathway – receptor linkage (may result in potential beneficial impacts on human health, controlled waters, property receptors and ecological receptors).	The areas of the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor.	No post-construction works are expected to be required to the existing pipelines excluding minor maintenance/upgrade works to be carried out from AGIs.
Operation	Permanent damage, disturbance or removal of geological features of interest (RIGS / LGS and GCR). Permanent compaction and degradation of soils. Permanent mineral severance or sterilization.	Adverse impacts on human health from contamination within shallow unsaturated soil and groundwater. Adverse impacts on unsaturated soil and groundwater deriving from pollution events bypassing the drainage system.	Impacts to human health and controlled waters caused by land contamination are considered unlikely as maintenance and operation of the Proposed Development will be in accordance with environmental legislation and good practice.
Decommissioning	Same as Construction Phase.	Same as construction phase.	Same as construction phase.

13. Landscape and Visual Amenity

13.1 Introduction

13.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on landscape and visual amenity. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

13.1.2 Landscape effects relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character. Seascapes will be taken into consideration due to the estuarine setting of the Proposed Development.

13.1.3 Visual effects relate to changes to existing views of identified visual receptors ('people'), from the loss or addition of features within their view due to the Proposed Development. For example, this may be residents or users of PRoW.

13.1.4 The Landscape and Visual Impact Assessment (LVIA) will be undertaken with reference to other environmental topics, including Ecology, Heritage and Arboriculture.

13.1.5 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report as well as **Chapter 9: Terrestrial and Aquatic Ecology**. An assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be included in the cultural heritage assessment as outlined in **Chapter 15: Cultural Heritage.**

13.1.6 This chapter is also supported by the following figures:

- **Figure 13-1:** National Landscape Designations;
- **Figure 13-2:** National Landscape and Marine Character Areas;
- **Figure 13-3:** Local Authority Boundaries;
- **Figure 13-4:** National Forestry Inventory;
- **Figure 13-5:** Public Rights of Way;
- **Figure 13-6**: Indicative Viewpoint Locations;
- **Figure 13-7:** Zone of Theoretical Visibility – 56 m Building Height; and
- **Figure 13-8:** Zone of Theoretical Visibility – 105 m Building Height.

13.2 Legislation, Policy and Guidance

13.2.1 The assessment will be undertaken in accordance with European Union (EU) directives; national acts, regulations, policy and guidance; and local policy, legislation and guidance.

13.2.2 A brief summary of the applicable national, regional and local legislation, policy and guidance related to this assessment is provided below:

National Legislation and Policy

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- The NP;
- WNMP 2019;
- UK MPSS;
- National Landscape Character Area (NLCA)13: Deeside and Wrexham (2014)[268];
- Marine Character Areas (MCA) 01: Dee Estuary (2015)[269];
- LANDMAP – the Welsh landscape baseline (2018)[270]; and
- National Character Area Profile NCA 59: Wirral (2014)[271].

Regional and Local Planning Policy

- FCC LDP;
- Wirral Local Plan Draft 2021-2037 (2022)[272];
- Cheshire West and Chester Council Local Plan (2015)[273];
- Cheshire West and Chester Landscape Strategy (2016)[274]; and
- Local Landscape Designations: Areas of Special County Value in Cheshire West and Chester (2017)[275].

[268] NRW, 2014; *National Landscape Character Area NLCA13: Deeside and Wrexham* [online]. Available at: https://cdn.cyfoethnaturiol.cymru/media/682570/nlca13-deeside-and-wrexham-description.pdf?mode=pad&rnd=131550580272430000
[269] NRW, 2015; *Marine Character Areas MCA 01: Dee Estuary* [online]. Available at: https://naturalresources.wales/media/674479/mca-01-dee-estuary-final.pdf
[270] Natural Resources Wales, 2018; *LANDMAP – the Welsh Landscape Baseline* [online]. Available at: https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/landmap-the-welsh-landscape-baseline/?lang=en
[271] Natural England, 2014; *National Character Area Profile NCA 59: Wirral* [online]. Available at: https://publications.naturalengland.org.uk/publication/6535185847812096
[272] Wirral Council, 2022; *Wirral Local Plan Draft 2021-2037* [online]. Available at: https://www.wirral.gov.uk/files/sd1-wirral-local-plan-2021-2037-submission-draft-may-2022-reg-19-publication-final-260422/download?inline
[273] Cheshire West and Chester Council, 2015; *Cheshire West and Chester Council Local Plan* [online]. Available at: https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan
[274] Brown, Anthony, and Graham Bradford, 2016; *Local Landscape Character Assessment - Landscape Strategy 2016* [online]. Available at: https://www.cheshirewestandchester.gov.uk/residents/planning-and-building-control/total-environment/local-landscape-character-assessment-landscape-strategy-2016
[275] Brown, Anthony, and Graham Bradford, 2017; *Local Landscape Designations: Areas of Special County Value in Cheshire West and Chester* [online]. Available at: https://consult.cheshirewestandchester.gov.uk/file/4583252 (Download)

Guidance

- Guidelines for Landscape and Visual Impact Assessment, Third Edition, 2013 (GLVIA3)[276];
- Visual Representation of Development Proposals, Technical Guidance Note 06/19[277];
- Assessing landscape value outside national designations, Technical Guidance Note 02/21[278]; and
- Infrastructure, Technical Guidance Note 04/2020[279].

13.3 Assumptions and Limitations

13.3.1 A site visit was undertaken in January 2024. While private land was not accessed, a number of views from publicly accessible land were visited and examined. The GLVIA3 guidance suggests that consideration be given to seasonal variation in effects where appropriate but acknowledges that the timing of the appraisal may mean that this is not practical.

13.3.2 It is not anticipated that any upgrades to existing pipelines along the Existing Natural Gas Connection Corridor or the Repurposed CO_2 Connection Corridor, beyond the scope of routine maintenance, will be required during construction of the Proposed Developmentas described in **Chapter 3: The Proposed Development**. While an appropriate baseline for these aspects of the Proposed Development has been identified in Section 13.4, these aspects are not considered further within this assessment given the assumption of no change in visual or landscape impact and hence no likely significant effects.

13.3.3 For the purposes of the LVIA, temporary durations are considered to be under one year; short term durations are considered to be between one and three years, medium term durations are considered to be between three and ten years, and long-term durations are considered to be more than ten years.

13.3.4 During the decommissioning phase, it is assumed that the Proposed Development will no longer be operational. The CCGT and CCP and associated structures and equipment will be removed in a manner similar to the construction phase, requiring machinery and localised excavation. It is currently expected that the proposed landscape enhancement measures will remain.

13.3.5 Uncertainties at this stage are the layout and vegetative composition of the Indicative Enhancement Area which is expected to contribute to an overall NBB being achievable.

13.3.6 Lighting assessments during the construction and decommissioning phases are scoped out of the assessment, as any lighting during the construction phase will be directional and temporary, and designed to minimise potential

[276] Landscape Institute and IEMA, 2013; *Guidelines for Landscape and Visual Impact Assessment, Third Edition, 2013*. London: Landscape Institute.
[277] Landscape Institute, 2019; *Visual Representation of Development Proposals, (The Landscape Institute's Technical Guidance Note 06/19*. London: Landscape Institute.
[278] Landscape Institute, 2021; *Assessing landscape value outside national designations, Technical Guidance Note 02/21*. London: Landscape Institute.
[279] Landscape Institute, 2020; *Infrastructure, Technical Guidance Note 04/2020*. London: Landscape Institute.

for light spillage beyond the Site, particularly towards houses, live traffic and ecological habitats in so far as it is reasonably practicable.

13.4 Baseline Conditions

Study Area

13.4.1 For the purposes of this scoping assessment, the study area is up to 10 km from the outer edge of the Site in terms of visual receptors. The extent of the study area has been defined and informed by a review of the Proposed Development description, initial evaluation of theoretical visibility, desk-based research, and professional judgement.

13.4.2 The extent of the study area will be reviewed during the development of the PEIR and the ES, following further desk-based review and site surveys undertaken as part of the assessment process and tailored as required to provide a proportional approach, focused on potential likely significant effects.

Sources of Information

13.4.3 The principal data sources used to inform the current baseline conditions presented in this Scoping Report comprise the following:

- OS mapping and aerial photography;
- LANDMAP;
- Data sites held within the MAGIC website;
- NRW National Landscape Character Area Profiles[280];
- NRW Marine Character Area Profiles[281];
- NLCA13 Deeside And Wrexham;
- FCC LDP;
- Local Landscape Character Assessment - Cheshire West and Chester Landscape Strategy 2016 LCT 9: Cheshire Plain West;
- Local Landscape Designations: Areas of Special County Value in Cheshire West and Chester (2017);
- Wirral Landscape Character Assessment 2019[282]; and
- National Character Areas: 58 Merseyside Conurbation[283], 60 Mersey Valley[284] and 61 Shropshire, Cheshire and Staffordshire Plain[285].

[280] NRW, 2014; *National Landscape Character Area Profiles* [online]. Available at: https://naturalresources.wales/evidence-and-data/maps/nlca/?lang=en
[281] NRW, 2015; *Marine Character Area Profiles* [online]. Available at: https://naturalresources.wales/evidence-and-data/maps/marine-character-areas/?lang=en
[282] Wirral Council, 2019; *Wirral Landscape Character Assessment 2019* [online]. Available at: https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/local-planning-evidence-and-research-report-35
[283] Natural England, 2013; *NCA Profile: 58 Merseyside Conurbation (NE505)* [online]. Available at: https://publications.naturalengland.org.uk/publication/5835259841085440
[284] Natural England, 2013; *NCA Profile: 60 Mersey Valley (NE492)* [online]. Available at: https://publications.naturalengland.org.uk/publication/6387892108656640
[285] Natural England, 2014; *NCA Profile: 61 Shropshire, Cheshire and Staffordshire Plain (NE556)* [online]. Available at: https://publications.naturalengland.org.uk/publication/6076647514046464.

Surveys

13.4.4 A site visit was undertaken to supplement the desk-based study and verify initial findings. The site visit was undertaken on a targeted basis using publicly accessible locations and informed by analysis of mapping and Zone of Theoretical Visibility (ZTV) modelling and focused on likely key receptors. Identified landscape character units were reviewed and amended where required to reflect existing conditions.

13.4.5 The site visit aided the identification of key visual receptor locations and established the nature of the existing views. In addition to informing the baseline, the site visit also guided judgements relating to nature of receptors (sensitivity), nature of effects (magnitude) and likely significance of effect in addition to identifying potential mitigation and/or enhancement.

The Site and its Setting

13.4.6 The Site and surrounding area are heavily influenced by large industrial structures and complexes as well as areas of open grassland to the west, as outlined in **Chapter 2: Description of the Existing Environment**.

13.4.7 The industrial complexes within the Connah's Quay industrial areas are heavily lit, which increases the area's visibility during the hours of darkness. The surrounding landscape contains localised tranquil areas including along the coast, the River Dee and inland nature reserves, although the large-scale structures are ever present within views.

13.4.8 The Site is situated approximately 8 km east from the Clwydian Range and Dee Valley National Landscape as shown in **Figure 13-1 (Appendix A).**

13.4.9 The Site is located within National Landscape Character Area 13: Deeside and Wrexham (NLCA13), defined by NRW as shown in **Figure 13-2 (Appendix A)**. The lowland around the mouth of the River Dee was reclaimed from the sea in the 18th century and the area has since become heavily industrialised. This low-lying topography slopes down to the lower River Dee and Dee Estuary. Glacial till, fluvio-glacial and river terrace drift to overlay in parts of the valley floor, giving rise to localised broad estuary land formed within tidal sand and mud flats.

13.4.10 A number of PRoW are identified within close proximity to the Site Boundary. Two PRoW, Footpath FL|Flint|66 and Footpath FL|Flint|67 are located within the Site Boundary as shown on **Figure 13-5 (Appendix A)**, and Connah's Quay Footpath 28 lies within the Indicative Enhancement Area.

13.4.11 The Site is situated along the southern shore of the Dee Estuary and is located within Marine Character Area 01: Dee Estuary (MCA01). This designation encompasses the large funnel shaped landform which forms a natural border between Wales and England.

13.4.12 The Site also forms part of the FLDP 2015 – 2030 (FLDP). Flintshire's landscape is the result of centuries of past human activity. According to Policy EN4: Landscape Character *'the effect of new development, either individually or cumulatively, must not have a significant adverse impact on the existing character and appearance of the landscape. Landscaping and other mitigation measures should seek to reduce landscape impact and where possible bring about enhancement'.*

13.4.13 The open countryside to the north of the Site, which overlooks the Dee Estuary, has been designated as an Area of Special County Value by the Cheshire West and Chester Council, for its distinctiveness, landscape character, and scenic views over the estuary.

13.4.14 There are several internationally designated sites within the vicinity of the Site. The Dee Estuary is designated as a Ramsar site, SAC, SPA, and SSSI due to its size and topography, its assemblage of diverse marine, coastal, and intertidal habitats, and its importance for passage and wintering waterfowl and intertidal plant species. The area of land directly north of the Main Site is comprised of large tracts of intertidal mudflats and saltmarsh within the Dee Estuary and are regularly underwater at high tide as outlined in **Chapter 10: Marine Ecology**.

13.4.15 The estuary is within a strategic location as it is close to mineral reserves, road and rail networks, and the River Dee canal connecting Chester to Liverpool Bay. The existing industrial installations form a dramatic skyline in close and mid distance views from the surrounding low-lying landscape.

13.4.16 There are no Landscape Character Designations covering the industrial complexes along the banks of the Dee Estuary, however, nationally important industries continue to dominate, including the existing Connah's Quay Power Station. The FLDP recognises that undesignated landscapes are important and new development, either individually or cumulatively, must not have a significant adverse impact on the character and appearance of the landscape.

13.4.17 The Dee Estuary has been evaluated as high overall scenic quality, integrity, character, and rarity by the NRW LANDMAP landscape baseline. There is an expanse of the Dee Estuary to the east of the Site that has been designated as outstanding habitat and historic value, while the surrounding area and the Site have been designated as moderate to low.

13.4.18 The expansive intertidal sand, mudflats, and saltmarsh of the Dee Estuary to the north and north-west of the Site contain inland views and urban/industrial influence, creating a contrasting maritime character with expansive views along the coast and out to the Irish Sea.

Representative Sensitive Receptors (Visual)

13.4.19 Viewpoints selected to represent a typical range of views of the Proposed Development will be agreed with the relevant LPAs. A plan identifying the LPAs is provided in **Figure 13-3 (Appendix A)**. A plan showing Indicative Viewpoint locations is provided in **Figure 13-6 (Appendix A).** The viewpoints selected include the following receptor types:

- residential receptors;
- PRoW users;
- recreational users of the study area;
- road users; and
- commercial/business users.

13.4.20 The viewpoints initially selected for the assessment included the below:

- Viewpoint A - Thors Rock, Thurstaston, Wirral;
- Viewpoint B - Wirral Country Park, Caldy, Wirral;
- Viewpoint C - Wirral Country Park, SSSI, Wirral Way, Thurstaston;
- Viewpoint D - Marine Drive, Heswall, Wirral;
- Viewpoint E - The Parade, Parkgate, Neston Wirral;
- Viewpoint F - Neston Road, Neston, Wirral;
- Viewpoint G - Windmill, Halkyn, Pentre Halkyn, Flintshire, Wales;
- Viewpoint H - Bagilt, Deebank, South of Flint Castle, Flintshire;
- Viewpoint I - Flint Castle, Castle Dyke Street, Flint, Flintshire, Wales;
- Viewpoint J - Chester Road, Oakenholt, Flint, Flintshire;
- Viewpoint K - Kelsterton Road, Rockcliffe, Connah's Quay, Flintshire;
- Viewpoint L - Kelsterton Cemetery, Memorial Garden, Rockcliffe, Connah's Quay, Flintshire;
- Viewpoint M - York Road, Golftyn, Connah's Quay, Flintshire;
- Viewpoint N - Chester Millenium Greenway, Sealand, Shotton, Flintshire;
- Viewpoint O - RSPB Burton Mere Wetlands, Wirral; and
- Viewpoint P – Moel Famau, Country Park, Clwydian Range and Dee Valley National Landscape.

13.4.21 Following the initial site visit, viewpoint B as shown on **Figure 13-6 (Appendix A)** was discounted due the near proximity to viewpoint C presenting a similar view.

13.4.22 The following two viewpoint locations require further investigation at the next stage of the project as access was not possible at the time of the initial site visit:

- Viewpoint O is located within the RSPB Burton Mere Wetlands, Puddington Lane in Burton and is located across the estuary adjacent to the Main Site.
- Viewpoint P The Clwydian Range and Dee Valley National Landscape runs in a northwest to southeast alignment approximately 8 km west of the Site Boundary.

13.4.23 It is accepted that not all viewpoint locations require identification or assessment, and that there will be replication in the type of change in visual amenity throughout the study area, which will be illustrated by the representative viewpoints.

Future Baseline

13.4.24 As described in **Chapter 3: The Proposed Development**, it is currently anticipated that the Applicant’s existing CCGT units at Connah’s Quay Power Station will be on-site and operating during construction and potentially operating during periods coinciding with the operation of the Proposed Development. The existing Connah’s Quay Power Station will therefore form part of the future baseline for the construction phase (which could

commence in 2026 and last up to four years for Train 1 or combined single phase for Train 1 and Train 2) and potentially during the operational phase of the Proposed Development. Further information on the assumptions will be provided in the PEIR.

13.4.25 Any other known committed developments, if any, which could have a bearing on landscape and visual effects in construction or operation will be set out in the PEIR.

13.5 Impact Assessment Methodology

13.5.1 The landscape and visual assessment will be conducted in accordance with the methodology and process set out in GLVIA3. GLVIA3 places a strong emphasis on the importance of professional judgement in identifying and defining the significance of landscape and visual effects. The assessment will be undertaken by Chartered Landscape Architects who are experienced in undertaking and reporting assessments of similar types of project.

13.5.2 An appropriate and proportionate approach will be taken to identify the key issues, sensitivities and likely significant effects associated with the landscape and visual topic. The assessment will be prepared in accordance with the best practice guidance outlined in Section □. As advocated by best practice guidance, professional judgement will be employed alongside structured assessment methods and defined criteria to determine the level and likely significance of effects.

13.5.3 Technical parameters regarding the height of the tallest elements of the Proposed Development will enable the definition of the study area within which landscape or visual effects have the potential to be significant. At this stage, it is considered likely that the tallest element of the Proposed Development will be the absorber column(s) and associated stack(s) which are anticipated to be circa 105 m AGL, with the next tallest structure being the CCGT and HRSG stack(s), which are anticipated to be circa 56 m AGL. It should be noted that it is currently anticipated that some targeted ground raising may be required to increase ground levels above the existing average ground height of 7.6 to 8 m AOD in order to protect critical operational infrastructure from flood events and considering the effects of climate change. Any assumptions made in relation to the parameters defined for the purposes of the assessment will be clearly outlined in the PEIR and ES.

13.5.4 Two ZTVs to represent the likely tallest elements of the Proposed Development have been prepared. The ZTVs include buildings and woodland barriers which provide visual screening across the landscape. The National Forest Inventory identifying woodland within the 10 km study area is provided in **Figure 13-4 (Appendix A)**. A ZTV modelled at 105 m building height AGL is provided in **Figure 13-8 (Appendix A)** and is representative of the theoretical zone of visual influence available for the likely tallest element(s) of the Proposed Development i.e. the absorber column stack(s). A ZTV modelled at 56 m is also provided in **Figure 13-7 (Appendix A)** representing the theoretical zone of visual influence available for the next tallest structures expected on the Main Site (HRSG by-pass stack(s)) main building envelope. These stack heights are considered to be suitably representative at this stage, based on previous experience. The final stack

heights will be established through air quality modelling as described in **Chapter 6: Air Quality**.

13.5.5 The assessment will be supported by and include photographs as appropriate. The planning context with respect to landscape character and visual amenity will also be assessed, considering relevant international, national, regional, and local planning policies. The baseline study will form the basis of the assessment of the predicted impacts of the Proposed Development.

13.5.6 A total of 15 representative daytime views have been identified within the ZTV for the main building envelope and the potential stacks and taller columns, as well as any structures required for the Proposed CO_2 Connection Corridor.

13.5.7 An initial site visit has been undertaken together with a review of the landscape and visual planning policy context in the vicinity of the Site. Using the Rochdale Envelope approach, the assessment will be based upon the maximum dimensions (e.g. widest buildings, maximum proposed height) for the buildings and structures of the Proposed Development using a parameters based approach.

13.5.8 Visual Representations of the Proposed Development for agreed representative views (visual receptors) will be produced in line with the guidance within the Landscape Institute's Technical Guidance Note 06/19. A plan of Indicative Viewpoint locations is provided in **Figure 13-6 (Appendix A)**.

13.5.9 An explanation of the criteria used to assess sensitivity, magnitude of impact and classification of landscape and visual effects will be provided within the PEIR and ES, and will broadly follow the methodology outlined in **Chapter 4: Project Alternatives and EIA Methodology**.

13.5.10 The sensitivity of the landscape receptor will be derived by combining the value of the landscape (undertaken as part of the baseline study) and the susceptibility to change of the receptor to the specific type of development being assessed.

13.5.11 The evaluation of landscape value will be informed by Technical Guidance Note 02/21 and undertaken considering the following factors: natural heritage, cultural heritage, landscape quality/condition, scenic quality, perceptual aspects, functional, rarity, representativeness/distinctiveness, recreation and association. Value will be classified as high, medium, low or very low with evidence provided as to the basis of the evaluation

13.5.12 Sensitivity of visual receptors will be defined through an assessment of the viewing expectation of the viewer and value placed on the view as identified in the baseline study, and its susceptibility to change as a result of the specific development.

13.5.13 Value of the view is an assessment of the value attached to views and is often informed by the appearance on OS or tourist maps and in guidebooks, literature and art, or identified in policy. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view and its scenic quality is also an indicator. The

value of the view will be classified as high, medium, low or very low and supported by evidenced, professional judgements.

13.5.14 The susceptibility of visual receptors to change will be established as a function of the occupation or activity of people experiencing the view, and the extent to which their attention or interest is focused on the view and the visual amenity they experience. For example, walkers whose interest may tend to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience, indicate a higher level of susceptibility. Conversely receptors engaged in outdoor sport where views are not important, or receptors at their place of work, are considered less susceptible to change.

13.5.15 Judgements about the susceptibility of visual receptors will be ascribed using high, medium, low or very low ratings using consistent and reasoned judgements.

13.5.16 An overall assessment of the magnitude of visual change resulting from the Proposed Development on the visual receptor will be made combining the above judgements using evidence and professional judgement. The levels of visual magnitude of change will be described as being high, medium, low, very low and none

13.5.17 An indication of how Nature of Receptor (Sensitivity) and Nature of Effect (Magnitude) will be combined is presented in **Table 13-1**. This is intended as a guide on possible outcomes and, as set out in GLVIA3, is not a prescriptive process leading to a pre-determined conclusion on likely significance of effects.

Table 13-1 Significance Matrix

Receptor sensitivity / value	Magnitude of Impact: High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

13.5.18 As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. Professional judgement will also be applied in reaching conclusions as to the significance of effects.

13.5.19 Examples of the significance of landscape and visual effects are described with reference to the criteria presented in **Table 13-2**.

Table **13-2** Significance of Effect**3**

Significance of Effect	Landscape	Visual

Major Beneficial	Alterations that result in a considerable improvement of the existing landscape resource. Valued characteristic features will be restored or reintroduced.	Alterations that typically result in a pronounced improvement in the existing view.
Moderate Beneficial	Alterations that result in a partial improvement of the existing landscape resource. Valued characteristic features will be largely restored or reintroduced.	Alterations that typically result in a noticeable improvement in the existing view.
Minor Beneficial	Alterations that result in a slight improvement of the existing landscape resource. Characteristic features will be partially restored.	Alterations that typically result in a limited improvement in the existing view.
Negligible Beneficial	Alterations that result in a very slight improvement to the existing landscape resource, not uncharacteristic within the receiving landscape.	Alterations that typically result in a barely perceptible improvement in the existing view.
Neutral	No alteration to any of the components that contribute to the existing landscape resource.	No change to the existing view.
Negligible Adverse	Alterations that result in a very slight deterioration to the existing landscape resource, not uncharacteristic within the receiving landscape.	Alterations that typically result in a barely perceptible deterioration in the existing view.
Minor Adverse	Alterations that result in a slight deterioration of the existing landscape resource. Characteristic features will be partially lost.	Alterations that typically result in a limited deterioration in the existing view.
Moderate Adverse	Alterations that result in a partial deterioration of the existing landscape resource. Valued characteristic features will be largely lost.	Alterations that typically result in a noticeable deterioration in the existing view.
Major Adverse	Alterations that result in a considerable deterioration of the existing landscape resource. Valued characteristic features will be wholly lost.	Alterations that typically result in a pronounced deterioration in the existing view.

13.6 Embedded Mitigation

13.6.1 This section will outline any likely mitigation measures to be incorporated within the design phase. These measures will be implemented to avoid, reduce, mitigate or offset any adverse environmental impacts of the Proposed Development.

13.6.2 Based on the scale and nature of the potential landscape and visual impacts mitigation will comprise typical measures encompassed within a CEMP, such as use of hoardings, fencing to protect any vegetation to be retained and measures to reduce visual impact in construction (e.g. dust suppression on highways). A Framework CEMP will be provided with the Application, with the

commitments on landscape mitigation within the final CEMP secured by the DCO.

13.6.3 The proposed design, in particular the designs of the absorber column(s) stack(s) and the CCGT HRSG stack(s), should include consideration of appearance to reduce visual impact, accepting the scale of the Proposed Development. This will include a colour study of the existing colour/materials of the surrounding landscape and the existing power station building.

13.6.4 Planting as a form of mitigation is unlikely to be effective at construction or operation due to the relatively short timescale of the former and scale of buildings in the latter. The baseline context will allow limited scope for significant screen planting within the Site.

13.6.5 The impact of night-time light pollution at operation will be considered as outlined in **Chapter 3: The Proposed Development.** An Indicative Lighting Strategy will be prepared and submitted as part of the Application. This will then inform the preparation of an external lighting scheme under a DCO requirement which will be designed in accordance with relevant standards, such as the Guidance Notes for the Reduction of Obtrusive Light (2021) published by the Institute of Lighting Engineers and/or CIBSE requirements, as appropriate. The strategy will seek to ensure that safe working conditions are provided whilst reducing light pollution and the visual impact on the local environment.

13.7 Potential Effects

13.7.1 The following potential impacts may be associated with the Proposed Development:

- temporary changes to landscape character and views from receptors in the vicinity of the Proposed Development during construction and decommissioning; and
- permanent or long term changes to landscape character and views from receptors in the vicinity of the Proposed Development during operation.

13.7.2 A summary of potential likely significant effects resulting from the Proposed Development in relation to landscape and visual impacts is provided below.

Construction

13.7.3 The construction phase of the Proposed Development may result in the following temporary impacts which have the potential to result in significant effects on landscape and visual receptors:

- physical change to the landscape or to views as a result of demolition/dismantling of structures and buildings; and
- change to the landscape or views as a result of the introduction of construction activity, both stationary and moving machinery and vehicles, and traffic management elements and introduction of temporary construction compounds, material storage areas, access tracks, and construction of the Proposed Development, including the use of cranes.

Operation

13.7.4 Operational phase impacts resulting from the Proposed Development with the potential to result in significant effects on landscape and visual receptors include:

- change to the landscape and views through the introduction of new infrastructure, including the CCGT and HRSG building which will reach an estimated elevation of approximately 56 m AGL and 56.9 m AGL with the potential increase in ground levels required, and the absorber column stack(s) at 105 m AGL, and other significant elements of the Proposed Development;
- changes to location and/or nature of ancillary infrastructure, such as signage, barriers and lighting; and
- changes to the level of Site activity (compared to the baseline).

Decommissioning

13.7.5 The decommissioning phase impacts on landscape and visual receptors are likely to be similar to the construction phase of the Proposed Development for the purposes of the landscape and visual impact assessment, these will be considered as resulting in similar likely significant effects. Following removal of any permanent structures during decommissioning of the Proposed Development, there are unlikely to be any permanent residual landscape and visual effects.

13.8 Additional Mitigation

13.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

13.9 Summary of Potential Likely Significant Effects

13.9.1 A summary of the potential significant effects to be scoped out or in of the ES is provided in **Table 13-4** below:

Table 13-4 Summary of the Potential Likely Significant Effects to be Considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Landscape and Visual Amenity			
Construction	Loss of landscape elements and/or change in landscape/ seascape character as a result of introduction of construction activity. Change in visual amenity as a result of views of construction activity, vehicles and tall machinery including cranes.	Night-time lighting	Any lighting during the construction phase will be directional and temporary, and designed to minimise potential for light spillage beyond the Site, particularly towards houses, live traffic and ecological habitats in so far as it is reasonably practicable. Given the existing high levels of lighting in the area, being industrial in nature, significant effects on sensitive receptors are considered unlikely and are therefore proposed to be scoped out of the assessment. An Indicative Lighting Strategy will be prepared and submitted as part of the Application. This will then inform the preparation of an external lighting scheme under a DCO requirement which will be designed in accordance with relevant standards.
Operation	Change in landscape/ seascape character as a result of the Proposed Development. Change in visual amenity as a result of views of the Proposed Development. The impact of night-time light pollution at operation will be considered.		
Decommissioning	Loss of landscape elements and/or change in landscape/ seascape character as a result of introduction of decommissioning activity. Loss of landscape elements and/or change in landscape/ seascape character as a result of the potential removal of elements within the Proposed Development.	Night-time lighting	Any lighting during the decommissioning phase will be directional and temporary, and designed to minimise potential for light spillage beyond the Site, particularly towards houses, live traffic and ecological habitats in so far as it is reasonably practicable. Given the existing high levels of lighting in the area, being industrial in nature, significant effects on sensitive receptors are considered unlikely.

	Change in visual amenity as a result of views of decommissioning activity, vehicles and tall machinery including cranes.
	Change in visual amenity as a result of the potential removal of elements within the Proposed Development.

14. Physical Processes

14.1 Introduction

14.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on Physical Processes. This has been informed by an overview of the environmental baseline conditions, along with the potential effects likely to be associated with the Proposed Development.

14.1.2 This chapter focuses on the River Dee and the physical processes up to MHWS. For the purposes of this scoping report, physical processes are defined as encompassing the following elements:

- geomorphology and sediments;
- meteorological and oceanographic conditions (wind, waves and tides);
- climate change effects;
- sediment transport processes; and
- water and marine sediment quality.

14.1.3 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report. This chapter should also be read in conjunction with the following relevant chapters: **Chapter 10: Marine Ecology**, **Chapter 11: Water Environment and Flood Risk**, **Chapter 12: Geology and Ground Conditions** and **Chapter 17: Climate Change**.

14.2 Legislation, Policy and Guidance

14.2.1 The following legislation is applicable to physical processes:

- MCAA 2009, which provides the legal mechanism to help ensure clean, healthy, safe and productive and biological diverse oceans and seas;
- The Marine Strategy Regulations 2010, which transpose the Marine Strategy Framework Directive (2008/56/EC) into UK legislation; and
- The Water Environment (WFD) (England and Wales) Regulations 2017, which transposes the EU Water Framework Directive (2000/60/EC) into UK legislation;

14.2.2 Relevant national policy applicable to marine ecological features includes:

- The NP;
- The WNMP will guide the sustainable development of Wales' marine area by setting out how proposals will be considered by decision-makers;
- PPW sets out the land use planning policies of the Welsh Government;
- UK MPS, which aims to achieve sustainable development in the UK marine area; and

- NPS for energy. The NPSs considered to be of relevance to the Proposed Development are:
  - The Overarching NPS for Energy (EN-1);
  - The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
  - The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4); and
  - The NPS for Electricity Networks Infrastructure (EN-5).

14.2.3 There are also a number of relevant local policies and plans including:

- FCC LDP. Relevant policies include:
  - Policy STR13: Natural and Built Environment, Green Networks and Infrastructure;
  - Policy EN2: Green Infrastructure;
  - Policy EN3: Undeveloped Coast and Dee Estuary Corridor; and
  - Policy EN6: Site of Biodiversity Importance.
- Shoreline Management Plans – the Proposed Development is located within the North West England and North Wales Coastal Group area called the Great Ormes Head to Solway Firth (SMP22).

14.3 Assumptions, Limitations and Uncertainties

14.3.1 No specific limitations have been identified in regard to the available marine baseline data.

14.3.2 There are currently uncertainties around the works proposed and construction methodology to be undertaken within the Water Connection Corridor. The Water Connection Corridor shown on **Figure 1-3 (Appendix A)** covers the maximum area that may be required for the construction and operation of existing and potentially new infrastructure for cooling and will be further refined as the design and EIA studies progress. It is not anticipated that any upgrades to existing pipelines along the Existing Natural Gas Connection Corridor, which goes under the Estuary (beyond the scope of routine maintenance) will be required during construction of the Proposed Development.

14.3.3 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

14.3.4 It is not anticipated that any upgrades to existing pipelines along the Repurposed CO_2 Connection Corridor, beyond the scope of routine maintenance, will be required during construction of the Proposed Development. While an appropriate baseline for these aspects of the Proposed Development has been identified in Section 14.4, these aspects are not considered further within this assessment.

14.4 Baseline Conditions

Study Area

14.4.1 In terms of the physical metocean conditions, the potential ZoI will extend beyond the Water Connection Corridor area. The environmental baseline conditions have therefore been characterised on a wider regional scale to include the River Dee, Dee Estuary and North Wales Coast as appropriate, up to MHWS.

14.4.2 Surface water, groundwater, and flood risk above MHWS are considered in **Chapter 11: Water Environment and Flood Risk**.

Sources of Information

14.4.3 The baseline data reviewed includes the following sources:

- ABPmer Physical Processes Modelling Results[286];
- ABPmer SEASTATES Data Explorer[287];
- Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales[288];
- Admiralty Tide Tables[289];
- Atlas of UK marine renewables resources: modelled wave, wind and tidal current[290];
- Awel y Mor Offshore Wind Farm Non-Technical Summary[291];
- BGS Geology Viewer;
- CEFAS Climatology Report (2016) Waters Suspended Sediment Concentrations (SSC)[292];
- Coastal Modelling Standard Update[293];
- Flood risk assessments: climate change allowances[294];
- Liverpool Bay Hydrodynamic Model[295];

[286] ABPmer, 2022; *Volume 4, Annex 2.3: Physical Processes Modelling Results* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010112/EN010112-000217-6.4.2.3_AyM_ES_Volume4_Annex2.3_PhysProResults_vFinal.pdf [Accessed: 27 November 2023].
[287] ABPmer, 2018; *Data Explorer (SEASTATES)* [online]. Available at: https://www.seastates.net [Accessed: 13 November 2023].
[288] Welsh Government, 2022; *Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales* [online]. https://www.gov.wales/sites/default/files/publications/2022-11/guidance-for-flood-and-coastal-erosion-risk-management-authorities-in-wales_0.pdf [Accessed 20 December 2023].
[289] UK Hydrographic Office, 2016; *Admiralty Tide Tables, NP201, Volume 1* [online]. Available at: https://www.admiralty.co.uk/publications/publications-and-reference-guides/admiralty-tide-tables#Findoutmore
[290] ABPmer, 2017; *Renewables Atlas* [online]. Available at: https://www.renewables-atlas.info/explore-the-atlas/ [Accessed: 13 November 2023].
[291] GoBe Consultants, 2022; *Non-technical summary* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010112/EN010112-000294-6.7.1_AyM_Non-technical_Summary_English_vFinal.pdf [Accessed: 27 November 2023].
[292] CEFAS, 2016; *Climatology Report, Waters Suspended sediment concentrations (SSC)* [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584621/CEFAS_2016_Suspended_Sediment_Climatologies_around_the_UK.pdf. [Accessed 23 November 2023].
[293] Environment Agency, 2022; Coastal Modelling Standard Update. Revision 1.1, April 2022.
[294] HM Government, 2016; *Flood risk assessments: climate change allowances* [online]. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances [Accessed 24 November 2023].
[295] AECOM, 2023; *Liverpool Bay Hydrodynamic Model*.

- Measuring suspended sediment and its wave and turbulence forcing in the Dee Estuary[296];
- Morphological evolution of the Dee Estuary, Eastern Irish Sea, UK: A tidal asymmetry approach[297];
- Numerical modelling of the hydrodynamics and sand transport in the tide-dominated coastal-to-estuarine region[298]; and
- Supporting study of the North West England and North Wales Shoreline Management Plan (SMP) 2[299]: Cell Eleven Tide and Sediment Transport Study (CETaSS) Phase 2 (ii)[300].

Geomorphology and Sediments

Geology

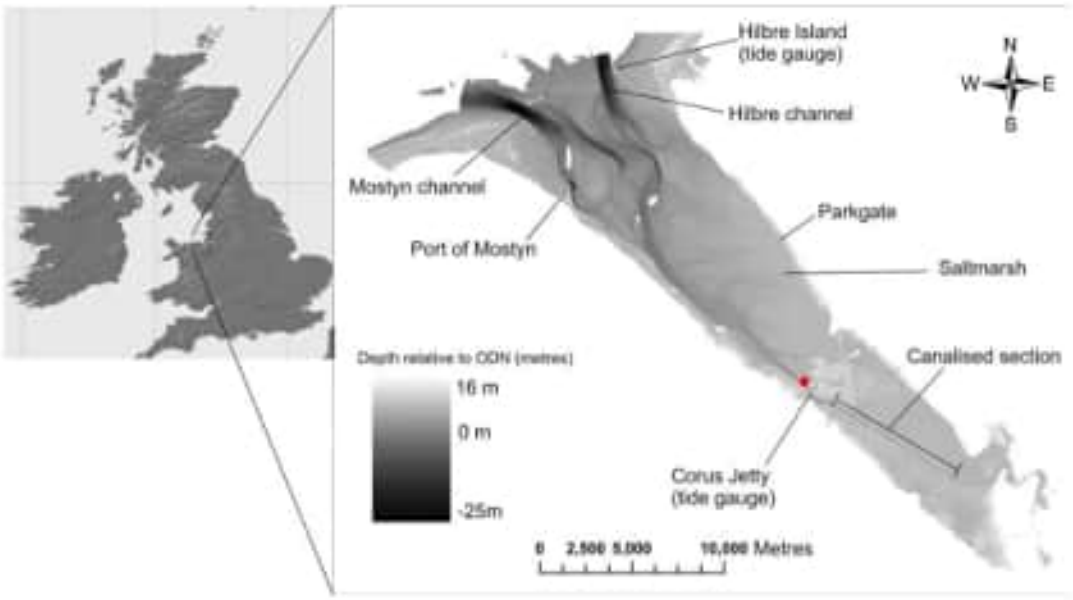
14.4.4 The Water Connection Corridor of the Proposed Development lies within a carboniferous bedrock band of Pennine Lower Coal Measures Formation, formed around 318 million years ago. The bedrock geology is overlain by surficial deposits, predominantly tidal flat deposits formed between 11.8 thousand years ago and the present day during the Quaternary period (BGS Geology Viewer).

Bathymetry

14.4.5 The overall bathymetry of the Dee Estuary, which is situated to the north-east of the Proposed Development, is shown in **Plate 14-1**. The figure depicts the location of the Site (red dot) where the river channel is below Chart Datum (CD) with depths within the wider estuary ranging from 17 m below CD to 8 m above. Much of the estuary consists of intertidal sand banks with a narrow navigation channel. The canalised section upstream of Connah's Quay is believed to have caused heavy siltation and accretion, allowing the creation of a saltmarsh environment within the wider estuary.

[296] Bolanos, R., Moate, B.D., and Souza, A.J., 2009; Measuring suspended sediment and its wave and turbulence forcing in the Dee Estuary. *Proceedings of Coastal Dynamics, 2009*. World Scientific.
[297] Moore,R.D., Wolf, J., Souza, A.J., and Flint, S.S., 2009; Morphological evolution of the Dee Estuary, Eastern Irish Sea, UK: A tidal asymmetry approach. *Geomorphology,* 103, 4, pp.588-596.
[298] Luo, J., Ming, L., Sun, Z., and O'Connor, B.A., 2013; Numerical modelling of hydrodynamics and sand transport in the tide-dominated coastal-to-estuarine region, *Marine Geology*, 341, pp.14-27.
[299] Halcrow, 2011; *North West England and North Wales Shoreline Management Plan SMP2; North West & North Wales Coastal Group.* Swindon: Halcrow Group.
[300] Halcrow, 2010; *North West England and North Wales Shoreline Management Plan SMP2 Supporting Studies. Cell Eleven Tide and Sediment Transport Study (CETaSS) Phase 2 (ii). Main Report – Summary of Findings*. Report prepared by Halcrow Group Ltd for the North West and North Wales Coastal Group, September 2010, 152pp

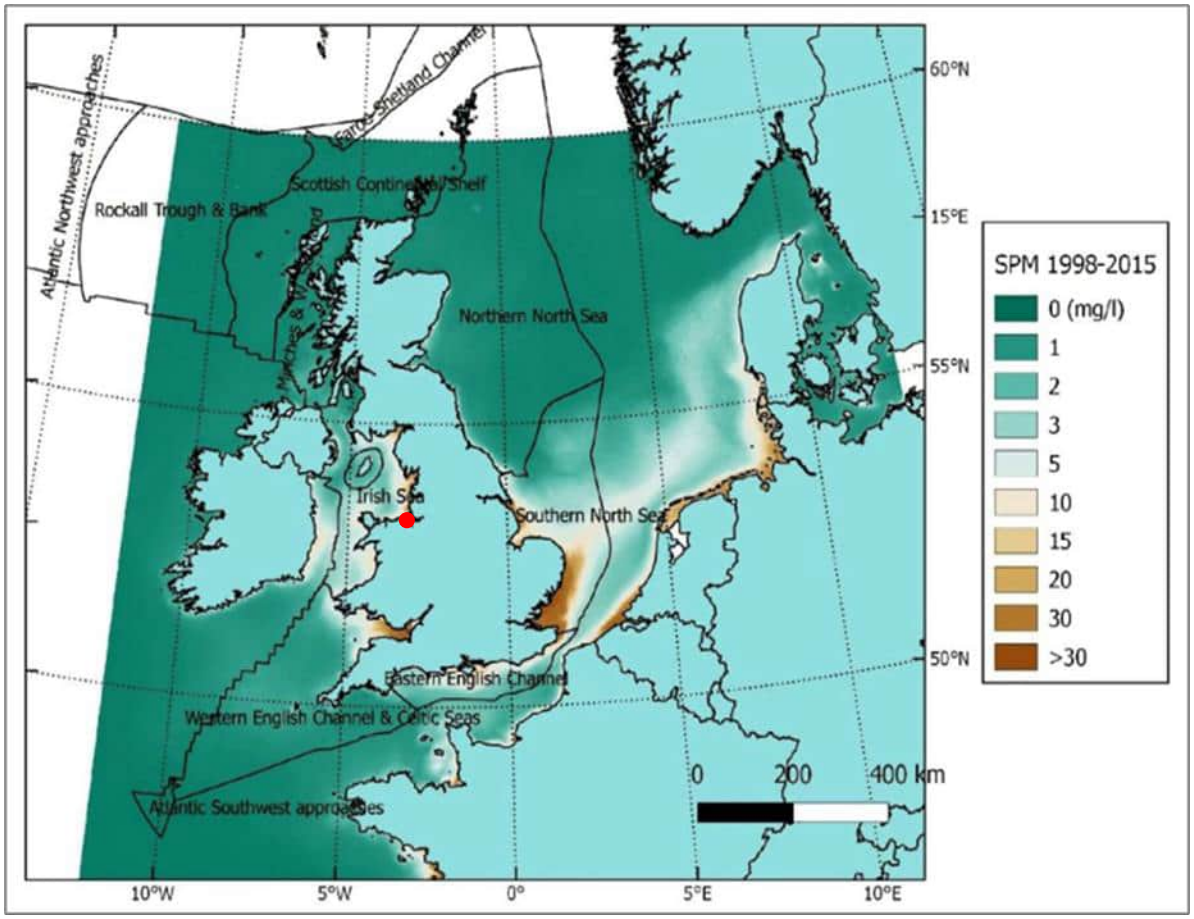
Plate 14-1 Bathymetry of the Site and wider Dee Estuary



Suspended Sediment

14.4.6 CEFAS provides the spatial distribution of average non-algal Suspended Particulate Matter (SPM) between 1998 and 2005 for the majority of the UK continental shelf (**Plate 14-2**). The largest plume concentrations are associated with the major estuaries and waterbodies, such as Liverpool Bay off the North Wales Coast, where the mean values of SPM are above 30 mg/l.

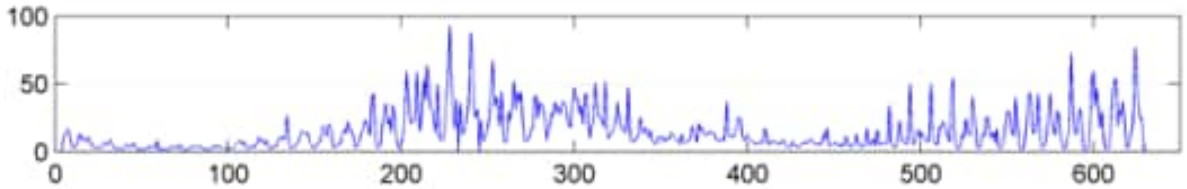
Plate 14-2 Average Suspended Sediment Around the UK



Source: CEFAS.

14.4.7 SPM values for the Dee Estuary are expected to be higher than in Liverpool Bay, which is confirmed by CEFAS in-situ measurements with values near the mouth frequently reaching 60 mg/l or higher, as shown in **Plate 14-3**. The highest concentrations were found to be relatively close to the bed (i.e. bottom 1 m) with peak values occurring in response to the flood and ebb tides as well as well as storm wave conditions. The mobilised sediment was found to have a mean particle size of 70 µm, representative of silt and fine sand fractions which is consistent with material within the estuary.

Plate 14-3 Measured suspended sediment concentrations (mg/l) plotted against time (h) from initial deployment in the Hilbre Channel



14.4.8 Although no measured data has been identified, sediment concentrations in the upper reaches of the Dee Estuary are likely to be elevated further due to the sheltered environment and additional sediment supply from the river.

Meteorological and Oceanographic Conditions

Water levels

14.4.9 **Table 14-1** presents tidal levels from the UK Hydrographic Office (UKHO) Admiralty Tide Tables for the Connah's Quay (0463) Secondary Non-Harmonic Port.

14.4.10 The Dee Estuary is classified as being a semi-diurnal, macrotidal environment which is subject to increasing tidal range from west to east which can be attributed to the funnel-shaped estuary.

Table 14-1 Tidal levels for Connah's Quay

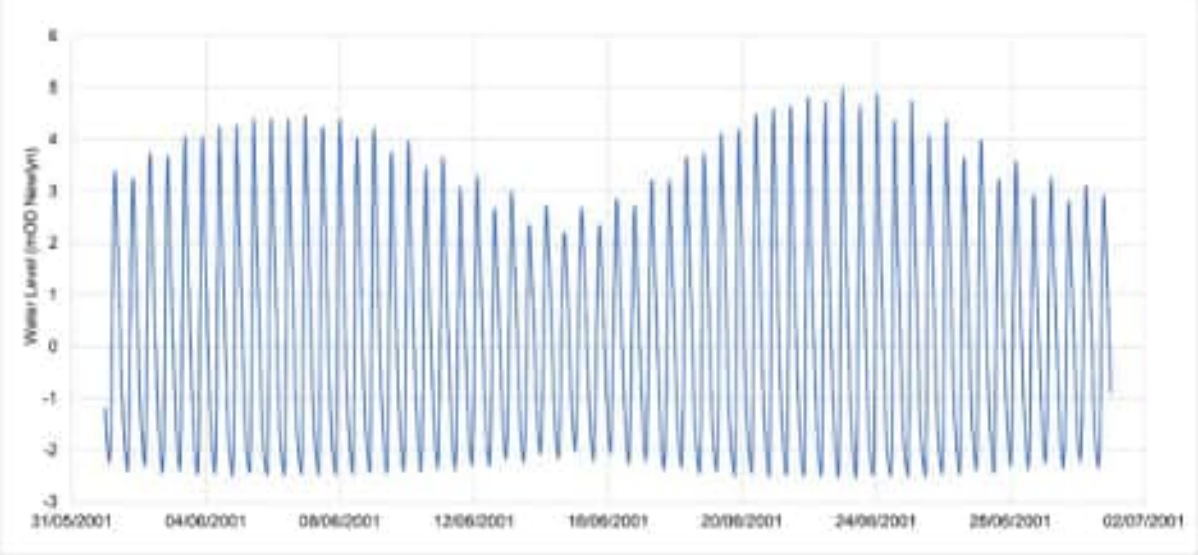
Description	Height (m Above Chart Datum)	Level (m Above Ordnance Datum Newlyn)
Highest Astronomical Tide (HAT)	5.5	+4.75
Mean High Water Springs (MHWS)	4.7	+3.95
Mean High Water Neaps (MHWN)	3.0	+2.25

Note 1. CD is 0.75 m below ODN.

14.4.11 A model was configured using the MIKE21 modelling software and has been calibrated and validated using available water level and current data. The data covers the one month period of June 2001. The location of the model output point relative to Connah's Quay is shown in **Plate 14-4.** Variations in local water levels are also shown in **Plate 14-5** based on results from a 2D depth-averaged hydrodynamic model covering the Dee Estuary.

Plate 14-4 Location of model output point in the Dee Estuary (AECOM, 2023)

Plate 14-5 Water levels (m ODN) in the upper Dee Estuary.



14.4.12 The nearshore tidal ellipse at the entrance to the Dee Estuary is orientated north north-west to south south-east. The major axis of this tidal ellipse is approximately 6.2 km in length (based on a mean tide) with a similar excursion distance likely to be found within the estuary.

14.4.13 Further offshore within the Irish Sea the ellipses are orientated west to east and are approximately 10–12 km long (based on a mean tide).

Waves and wind

14.4.14 The ABPmer SEASTATES data explorer was used to provide an indication of the wind and wave conditions for the regional area.

14.4.15 The closest available data point is at the entrance of Dee Estuary and has therefore been used to provide indicative local wind and wave conditions.

14.4.16 **Plate 14-6** provides a wave rose for significant wave height which shows that that the dominant direction of waves reaching the estuary mouth is from the north-west. Similarly, **Plate 14-7** provides a summary of wind conditions with the dominant direction from west to south-west.

Plate 14-6 Significant wave height at the entrance to the Dee Estuary.

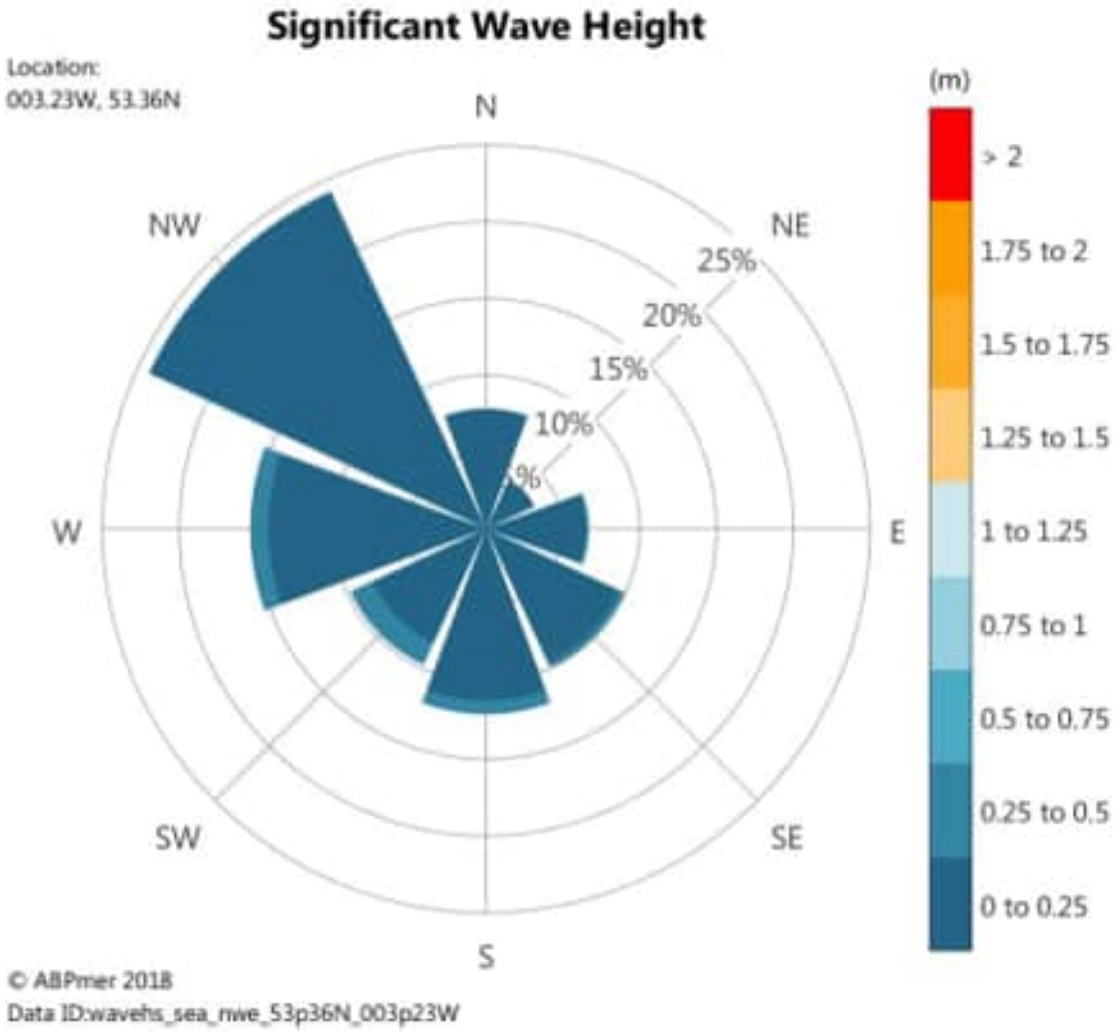
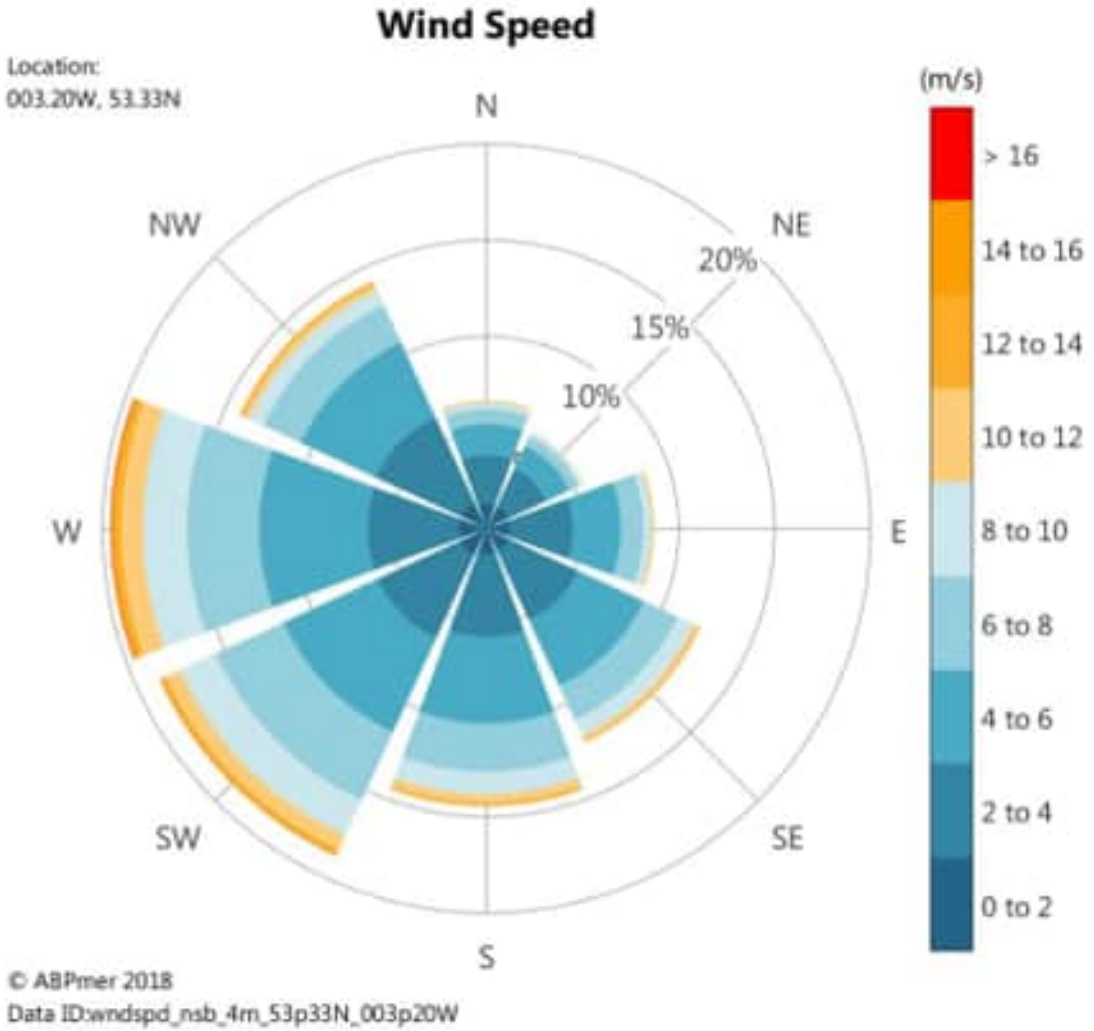


Plate 14-7 Wind speed at the entrance to the Dee Estuary.

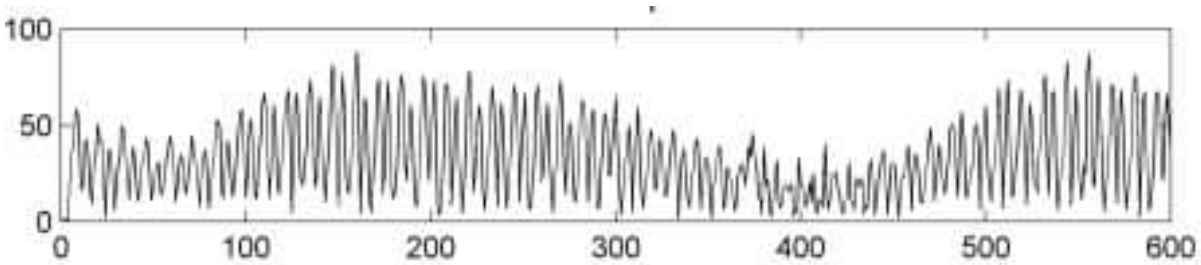


Tidal currents

14.4.17 Tidal currents are an important component of the physical environment, influencing aspects such as sediment transport and dispersion of suspended sediment.

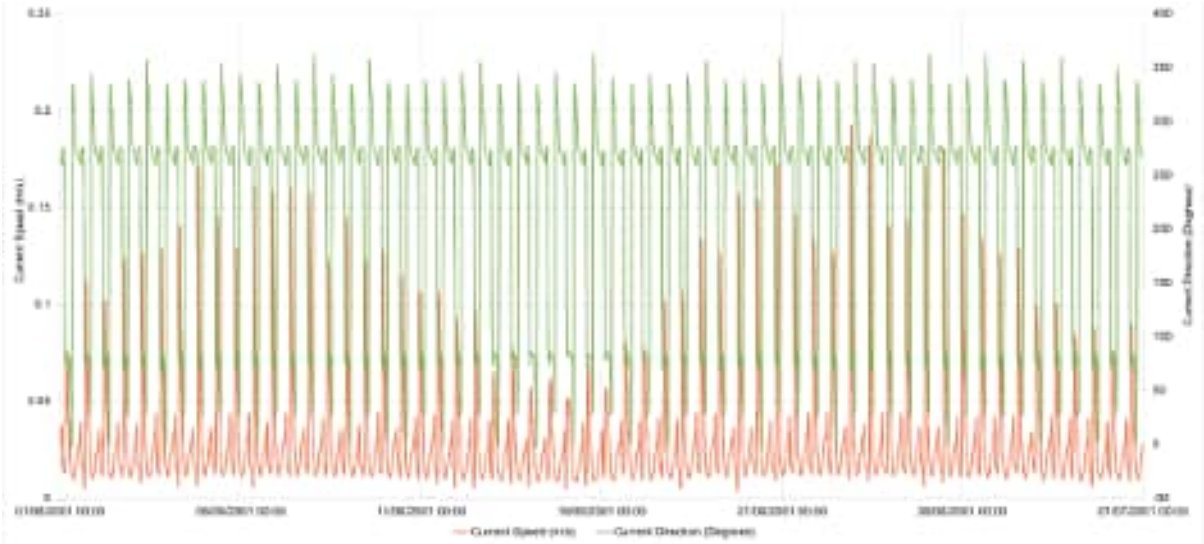
14.4.18 **Plate 14-8** shows the variation in tidal currents in the Hilbre Channel off the Wirral coast near the mouth of the estuary where peak currents over a spring-neap cycle are shown to be approximately 0.8 m/s (or 80 cm/s).

Plate 14-8 Current speed (cm/s) plotted against time (h) from initial deployment in the Hilbre Channel



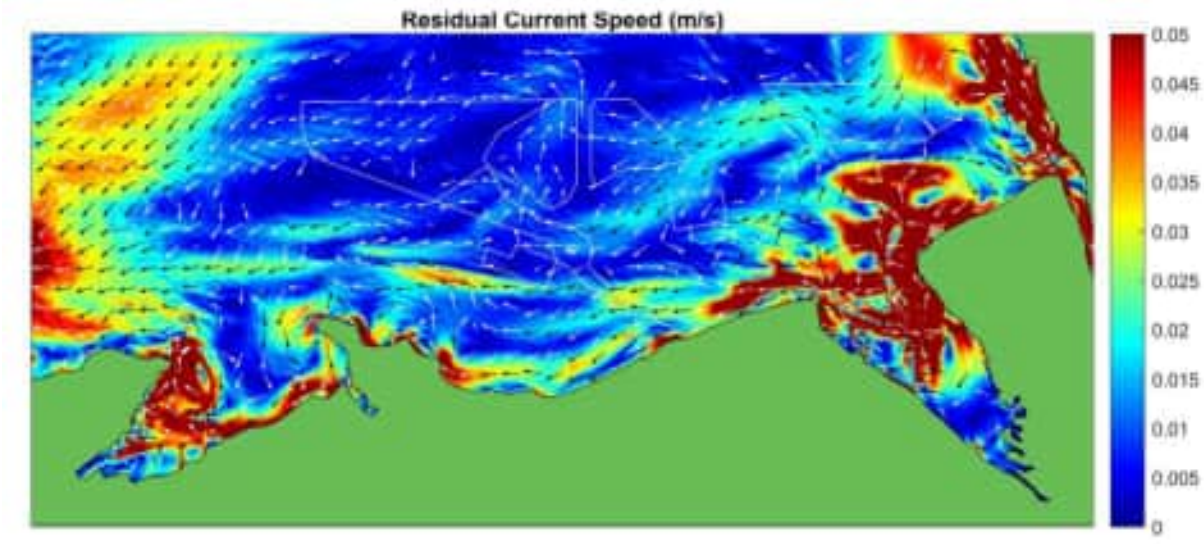
14.4.19 Model-predicted tidal currents are presented in **Plate 14-9** for the location shown in **Plate 14-4**. Over the spring-neap cycle a peak current speed of 0.2 m/s is found confirming that tidal currents reduce in magnitude further upstream. This suggests that the upper reaches are likely to be a more depositional environment.

Plate 14-9 Tidal current speed and direction, at the Dee Estuary (north of the Site)



14.4.20 **Plate 14-10** shows residual tidal currents prepared for a study of a proposed windfarm development (Awel Y Mor) and shows the variation of these residuals within the Dee Estuary as derived over a spring-neap tidal cycle. Tidal residuals can be used to infer potential sediment transport pathways and, in this case, suggest that tidal-induced sediment transport is significant in the coastal region and extending into the Dee Estuary but is less influential in the upper reaches, including the Connah's Quay study area. It is therefore assumed that river flow conditions will have an important influence on physical processes at this location.

Plate 14-10 Residual current vectors for a spring-neap tidal cycle Climate Change



14.4.21 For the assessment of changes to physical processes under a different future climate change scenario, the UK guidance and projection of sea level

rise and increased storminess are applied to the baseline (present day) conditions.

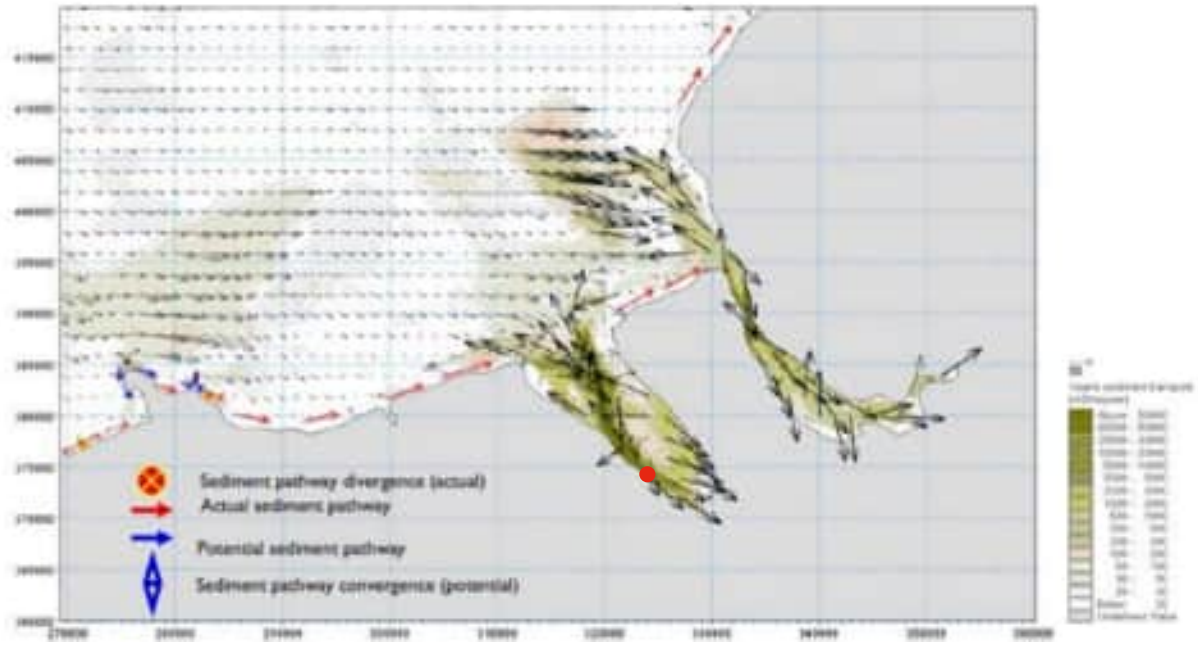
14.4.22 Changes in future wind and wave conditions are provided in Environment Agency 2016, 'Flood Risk Assessments: Climate Change Allowances, and Welsh Government guidance The guidance states that wind speeds and wave height should be increased by 5% between 1990 and 2055 and by 10% for 2056 to 2115.

14.4.23 The UK Climate Projections (UKCP18) provides the most up-to-date assessment of how the climate may change up to 2100 and post-2100. Sea level rise data along the UK coastline is available from the Met Office UKCP18 website[301] for the relevant grid square. According to this data, by 2050, sea level rise may rise by 0.22 m above 2023 levels at the Site. This is estimated for a high emissions scenario (RCP 8.5) in the 95th percentile.

Sediment Transport Processes

14.4.24 The Dee Estuary is flood dominant with stronger currents during the flood phase of the tide resulting in the net movement of sediment into the estuary (**Plate 14-11**). The primary sediment source results from the inshore movement of material from the Irish Sea. The black vector arrows show yearly estimated subtidal sand transport under representative tide and wave forcing and the red arrows indicate actual littoral transport pathways with the blue arrows indicating potential littoral transport pathways where sediment is present.

Plate 14-11 Annual average littoral and subtidal sediment transport vectors within the Dee Estuary

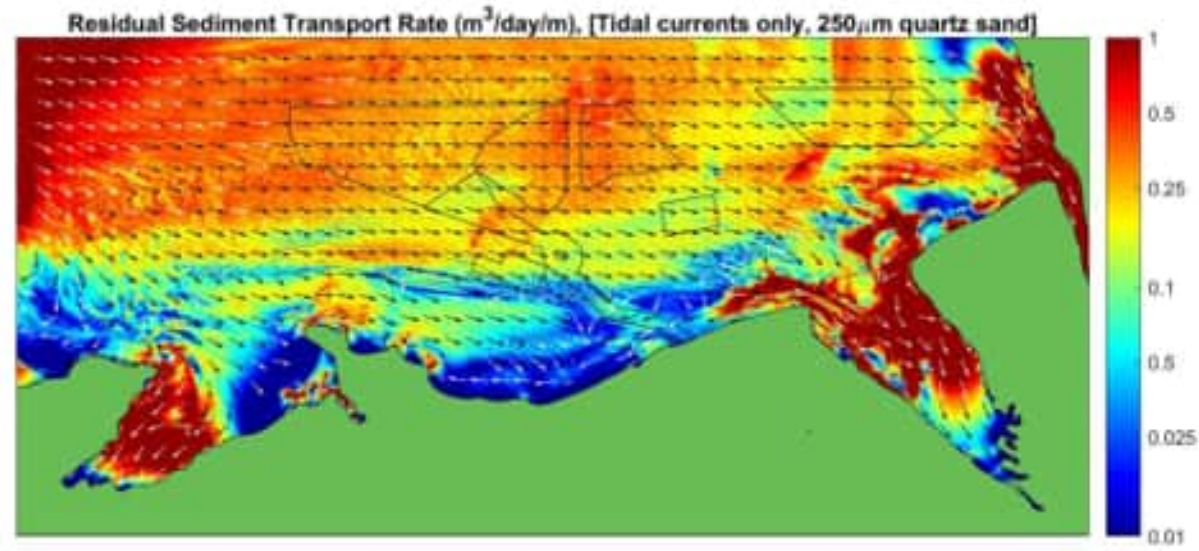


14.4.25 The estuary is a major sink of fine sands which are stored within the sandbanks at the mouth of the estuary, such as the East Hoyle Bank.

[301] UKCP, 2023; *UK Climate Projections User Interface* [online]. Available at: Welcome to UKCP (metoffice.gov.uk). [Accessed: 24 November 2023].

14.4.26 ABPmer modelling results for the proposed Awel Y Mor offshore wind farm study provide indicative residual sediment transport rates under tidal currents for sand (**Plate 14-12**). Similar to the pattern of residual currents, the potential for high sediment transport is shown within the outer estuary whereas in the inner estuary transport rates are significantly reduced.

Plate 14-12 Residual sediment transport rate within the Dee Estuary



Water Quality

14.4.27 Detailed information on water quality is provided in **Chapter 11: Water Environment and Flood Risk**.

Marine Sediment Quality

14.4.28 For the offshore windfarm (Awel Y Mor), the non-technical summary summarises the marine sediment quality in the area offshore (north-west) from the study area, although the marine sediment quality is expected to vary from this closer to the Main Site of the Proposed Development due to the riverine inputs from the River Dee.

14.4.29 The contaminant analysis identified that metal concentrations in sediment samples were below the marine sediment quality guidelines within the windfarm area, apart from arsenic, whose concentration levels were slightly elevated as a result of geological inputs from the North Wales coastal region.

14.4.30 Site-specific data may be required, depending on the confirmation of works required in the Water Connection Corridor, to provide an informed assessment of sediment quality for the inner estuary areas, particularly where there is potential for the seabed material to be disturbed. Such data would include sediment cores / grabs.

14.5 Impact Assessment Methodology

Assessment Methodology

14.5.1 In many cases, there is no defined receptor for the physical environment but instead the physical processes act as a pathway which has the potential to impact other receptors (i.e. increased deposition resulting from the

disturbance of seabed material could have an adverse impact on benthic habitats). One exception to this is coastal morphology which will be considered as a receptor in its own right.

14.5.2 Subject to confirmation of the Project Development, in particular the requirement for temporary works in the river, an existing hydrodynamic model may be used to investigate changes in flow patterns and the potential for modified flows to mobilise sediment which may or may not be contaminated. If these flows are demonstrated to result in the mobilisation of sediment, modelling the dispersion of disturbed sediments would also be undertaken.

14.5.3 Any numerical modelling of coastal processes will be undertaken in accordance with current standards as developed by the Environment Agency given that no comparable standard has been developed by NRW.

14.5.4 The appraisal methodology has been developed to incorporate the principles of IEMA. The appraisal process ranks impacts according to their likely significance determined by considering magnitude of change and receptor sensitivity. An example of a matrix used to derive the likely significance of an effect is given in **Table 14-2.**

Table 14-2 Example matrix to derive likely significance of an effect

Sensitivity or value of resource / receptor	Magnitude of impact			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

14.6 Embedded Mitigation

14.6.1 As far as reasonably practicable, potentially significant likely adverse effects will be avoided through embedded design measures.

14.6.2 Construction phase impacts will likely be mitigated through the implementation of standard construction techniques and mitigation measures, as are described in a wide range of good practice publications which will be listed in the ES.

14.6.3 Measures during construction, including good practice, will be included and implemented through the Framework CEMP and SWMP or permitting regimes including any DML that may form part of the DCO.

14.7 Potential Effects

14.7.1 Changes in physical processes within the study area as a result of the Proposed Development are considered as ‘sources’ of a change and ‘impact pathways’ for effects which have potential influence on other environmental receptors.

Sources

Sources of construction impacts

- temporary works – cofferdam installation; and
- the potential construction of a new intake and outfall, and / or maintenance of the existing structure.

Sources of operation impacts

- presence of new outfall structure;
- maintenance dredging; and
- abstraction and discharge of water through the Water Connection Corridor.

Sources of decommissioning impacts

- temporary works for removal of outfall (assumed same as construction); and
- removal of outfall structure.

Impact Pathways

14.7.2 This section identities whether there are any impact pathways that could give rise to potentially likely significant effects on the receptors within the physical environment study area.

Increased suspended sediment (SSC)

14.7.3 During construction and decommissioning phases, temporary works may include installation of a cofferdam to enable removal and replacement of structures within the marine environment. The addition of a new outfall and intake structure may also be required subject to ongoing technical studies. The cofferdam will temporarily block / restrict movement of suspended sediment across the River Dee channel and may lead to increased levels of suspended sediment and contaminant dispersion. Disturbed suspended sediment in the River Dee may also be caused by localised bed disturbance and release of fine sediments from other construction activities associated with the Proposed Development.

14.7.4 During operation, temporary increases in SSC sediment deposition may also occur from potential maintenance dredging, potentially leading to contaminant mobilisation turbidity.

14.7.5 Therefore, this impact pathway has the potential to result in likely significant effects and is scoped in.

Changes to seabed / riverbed morphology

14.7.6 The temporary works during construction and decommissioning phases of the Proposed Development may also cause localised disturbance to the morphology of the seabed / riverbed. The morphology may be altered temporarily due to the cofferdam. Scour could occur against the cofferdam and bed morphology may be slightly altered, but any effects are likely to be highly localised and reversed following removal of temporary structures.

14.7.7 Water will be abstracted from and discharged to the River Dee in the Water Connection Corridor. The abstraction will take place during a three-hour period per tide around high water (one hour before and two hours after). The water abstraction and discharge may adjust the flow of the water and movement of sediment within the channel. If a significant volume of water is discharged, this flow adjustment may affect the seabed / riverbed levels. Despite this, the impact is expected to be minimal due to the abstraction and discharge taking place during high tide. Any flow disruption will be replaced during normal conditions.

14.7.8 Discharge of cooling water could impact the seabed / riverbed levels. However, purge discharge is limited to not more than three hours commencing on the ebb tide one hour after high water. Due to the discharge taking place during this part of the tide, the effect caused to the seabed levels can be considered negligible.

14.7.9 This impact pathway of changes to morphology caused by construction, operation and decommissioning activities is therefore proposed to be scoped out.

Increased scour

14.7.10 During operation of the Proposed Works, there may be localised scouring around the outfall structure. The scour around the structure could cause changes in bed levels. This disturbance will be highly localised and would have a minimal effect.

14.7.11 This impact pathway of changes to morphology caused by operation activities is therefore proposed to be scoped out.

Increased water temperature

14.7.12 If the thermal load from the cooling water discharge during operation phase activities is higher than with the current arrangement, this could lead to elevated temperature increase with the potential to affect sensitive receptors, such as migrating fish. This impact pathway is considered to have the potential for likely significant effects and therefore is scoped in.

14.8 Additional Mitigation

14.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

14.9 Summary of Potential Likely Significant Effects

14.9.1 A summary of potentially significant effects is provided in **Table 14-3**.

Table 14-3 Summary of the potential likely significant effects to be considered in the ES.

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Construction	Temporary suspended sediment disturbance and contaminant dispersion.	Localised disturbance to the bed morphology caused by the cofferdam and temporary structures.	The morphology of the seabed/ riverbed can be expected to rapidly recover to a stable condition after removal of the temporary cofferdam structures.
Operation	Increased thermal discharge, if the thermal load from the cooling water is greater than the current arrangement.	Scouring due to the presence of new outfall structures affecting local flows and seabed levels.	This has been scoped out since any effect will be highly localised and occur over a relatively short timescale (i.e. a few tides) before stabilising and would be no different to operational effects due to the existing outfall.
	Temporary suspended sediment disturbance and contaminant dispersion.	The Water Connection Corridor will discharge and abstract water from the River Dee and could disrupt the movement of water and sediment through the channel. During the discharge from the corridor, the seabed levels could be impacted if there was a significant volume of water discharging.	The discharge and abstraction are due to take place only during high tide and during a maximum time period of three hours. The potential effect on the flow of water and sediment will be negligible due to controlled release and abstraction. The discharge is controlled and is only released within a three-hour period around high tide on the ebb phase. There will therefore be limited interaction between the discharged water and the bed.
Decommissioning	Temporary suspended sediment disturbance and contaminant dispersion.	Localised disturbance to the bed morphology caused by the cofferdam and temporary structures.	The morphology of the seabed can be expected to rapidly recover to a stable condition after removal of the temporary cofferdam structures.

15. Cultural Heritage

15.1 Introduction

15.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on Cultural Heritage for both the terrestrial and marine environments. This has been informed by an overview of the environmental baseline conditions, along with the potential effects likely to be associated with the Proposed Development.

- This chapter should be read in conjunction with **Chapter 3: The Proposed Development** of this scoping report. This chapter should also be read in conjunction with the following relevant chapters: **Chapter 13: Landscape and Visual Amenity**; and **Chapter 14: Physical Processes**.

15.1.2 This chapter is also supported by the following figures:

- **Figure 15-1:** Designated Heritage; and
- **Figure 15-2:** Location of Marine and Cultural Heritage Study Area.

15.2 Legislation, Policy and Guidance

15.2.1 The potential effects of the Proposed Development on terrestrial and marine historic assets have been considered with respect to the requirements of the relevant policy, legislation and guidance, including national and local planning policy and other guidance.

Terrestrial Historic Environment

Legislation

- Levelling-up and Regeneration Act 2023[302];
- Historic Environment (Wales) Act 2016;
- Ancient Monuments and Archaeological Areas Act 1979[303] (as amended);
- Planning (Listed Buildings and Conservation Areas) Act 1990[304]; and
- The Hedgerow Regulations 1997.

National Planning Policy

15.2.2 The following national planning policy is relevant to the terrestrial archaeology assessment:

- PPW 2023;
- TAN 24: the historic environment;
- The Overarching NPS for Energy (EN-1);

[302] *Levelling-up and Regeneration Act 2023* (c. 55). London: HMSO.
[303] *Ancient Monuments and Archaeological Areas Act 1979* (c. 46). London: HMSO.
[304] *Planning (Listed Buildings and Conservation Areas) Act 1990* (c. 9). London: HMSO.

- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4); and
- The NPS for Electricity Networks Infrastructure (EN-5).

Local Planning Policy

15.2.3 The following local planning policy is relevant to the terrestrial archaeology assessment:

- FCC LDP.

Other Policies and Guidance

15.2.4 The following guidance is relevant to the terrestrial assessment of the historic resource:

- Principles of Cultural Heritage Impact Assessment in the UK[305];
- Conservation Principles for the sustainable management of the historic environment in Wales[306];
- Setting of Historic Assets in Wales[307];
- Heritage Impact Assessment in Wales[308];
- Managing Historic Character in Wales[309];
- Managing Lists of Historical Assets of Special Local Interest[310];
- Managing Change to Registered Historic Parks and Gardens in Wales[311];
- Managing Listed Buildings at Risk in Wales[312];
- Managing Change to Listed Buildings in Wales[313];
- Managing Conservation Areas in Wales[314];

[305] IEMA, 2021; *Principles of Cultural Heritage Impact Assessment in the UK*. March: IEMA.
[306] Cadw, 2011; *Conservation Principles for the sustainable management of the historic environment in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Conservation_Principles_EN_0.pdf
[307] Cadw, 2017; *Setting of Historic Assets in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Setting%20of%20Historic%20Assets%20in%20Wales%20EN.pdf
[308] Cadw, 2017; *Heritage Impact Assessment in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/20170531Heritage%20Impact%20Assessment%20in%20Wales%2026917%20EN.pdf
[309] Cadw, 2017; *Managing Historic Character in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Managing%20Historic%20Character%20in%20Wales%20%20EN.pdf
[310] Cadw, 2017; *Managing Lists of Historical Assets of Special Local Interest* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Managing%20Lists%20of%20Historic%20Assets%20of%20Special%20Local%20Interest%20in%20Wales%20EN.pdf
[311] Cadw, 2017; *Managing Change to Registered Historic Parks and Gardens in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/20170531Managing%20Change%20to%20Registered%20Historic%20Parks%20%26%20Gardens%20in%20Wales%2026922%20EN.pdf
[312] Cadw, 2017; *Managing Listed Buildings at Risk in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/20170531Managing%20Listed%20Buildings%20at%20Risk%20in%20Wales%2031144%20EN.pdf
[313] Cadw, 2017; *Managing Change to Listed Buildings in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/20170531Managing%20Change%20to%20Listed%20Buildings%20in%20Wales%2024303%20EN.pdf
[314] Cadw, 2017; *Managing Conservation Areas in Wales* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/20170531Managing%20Conservation%20Areas%20in%20Wales%2028424%20EN.pdf

- Guide to the Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process (ASIDOHL2)[315] (Cadw, 2017);
- A Research Framework for the Archaeology of Wales[316];
- Chartered Institute for Archaeologists (CIfA) Code of Conduct[317];
- Standard and guidance for historic environment desk-based assessment[318]; and
- The Welsh Archaeological Trusts (WAT) Code of Practice for provision of archaeological advice[319].

Marine Historic Environment

15.2.5 Cadw is responsible for the archaeological resource within Wales' territorial waters, from MHWS to the 12 nm limit, while the main source of information on underwater heritage in Wales is the marine database of the National Monument Record compiled by the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW). NRW is responsible for licensing, regulating and planning marine activities in the seas around Wales to ensure they are carried out in a sustainable way.

15.2.6 The Historic Environment (Wales) Act 2016 is the fundamental statutory framework for the protection and management of the Welsh historic environment, along with the Ancient Monuments and Archaeological Areas Act 1970, the TCPA 1990 and the Protection of Wrecks Act 1973[320].

15.2.7 The Welsh National Marine Plan identifies opportunities for the sustainable development of Wales' seas[321] by guiding new development and related decisions both inshore and offshore. Development plans and the Marine Plan should work together and support integrated decision making and collaboration across marine and terrestrial interfaces and boundaries[322].

Legislation

15.2.8 The Proposed Development is located in Welsh territorial waters (up to 12 nm from the coast). The following legislation applies:

- Protection of Wrecks Act (PWA) 1973 (Section One and Two);
- Ancient Monuments and Archaeological Areas Act (AMAA)1979 (as amended);
- Protection of Military Remains Act (PMRA) 1986[323];

[315] Cadw, 2007; *Guide to the Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process; Revised (2nd) Edition Including Revisions to the Assessment Process (ASIDOHL2)* [online]. Available at: https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf
[316] Institute of Field Archaeologists Wales, 2016; *A Research Framework for the Archaeology of Wales* [online]. Available at: https://archaeoleg.org.uk/index.html
[317] CIfA, 2022; *Code of Conduct: Professional Ethics in Archaeology* [online]. Available at: https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2022.pdf
[318] CIfA, 2020; *Standard and guidance for historic environment desk-based assessment* [online]. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf
[319] WAT, 2017; *The Welsh Archaeological Trusts Code of Practice for provision of archaeological advice* [online]. Available at: https://cpat.org.uk/docs/codeofpractice2017.pdf
[320] *Protection of Wrecks Act 1973* (c. 33). London: HMSO.
[321] Welsh Government 2019 Welsh National Marine Plan November 2019
[322] Welsh Government 2021a Planning Policy Wales Edition 11
[323] *Protection of Military Remains Act 1986* (c. 35). London: HMSO.

- Merchant Shipping Act 1995[324]; and
- MCAA 2009.

National Planning Policy

15.2.9 As the Proposed Development is located within Welsh territorial waters and the UK Exclusive Economic Zone (EEZ), there is policy to consider in relation to the marine historic environment. These are outlined below and will also be considered in relation to the marine archaeology and cultural heritage in-river EIA:

- UK MPS;
- The NP;
- The WNMP:
  - SOC_04: Welsh language and culture; and
  - SOC_05: Historic assets.

Local Planning Policy

- FCC LDP.

Other Policies and Guidance

15.2.10 The assessment of marine archaeology and cultural heritage receptors will comply with the following guidance documents where they are specific to this topic:

- Caring for Coastal Heritage[325];
- Caring for Military Sites of the Twentieth Century[326];
- Conservation Principles for the Sustainable Management of the Historic Environment in Wales[327];
- Managing the Marine Historic Environment of Wales[328];
- The Code of Practice for Seabed Development[329];
- Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy[330];
- Our Seas – A shared resource: High level marine objectives[331];
- Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest[332]; and

[324] *Merchant Shipping Act 1995* (c. 21). London: HMSO.
[325] Cadw, 1999; *Caring for Coastal Heritage*. Cardiff: Cadw.
[326] Cadw, 2009; *Caring for Military Sites of the Twentieth Century*. Cardiff: Cadw.
[327] Cadw, 2011; *Conservation Principles for the Sustainable Management of the Historic Environment in Wales*. Cardiff: Cadw.
[328] Cadw, 2020; *Managing the Marine Historic Environment of Wales*. Cardiff: Cadw.
[329] Joint Nautical Archaeology Policy Committee and Crown Estate, 2006; *Maritime Cultural Heritage & Seabed Development: JNAPC Code of Practice.* York: Council for British Archaeology
[330] Oxford Archaeology & George Lambrick Archaeology and Heritage, 2008; *Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy*, commissioned by COWRIE Ltd (project reference CIARCH-11-2006);
[331] DEFRA, 2009; *Our Seas – A shared resource: High level marine objectives* [online]. Available at: https://assets.publishing.service.gov.uk/media/5a7a0cdc40f0b66a2fbff885/ourseas-2009update.pdf.
[332] The World Association for Waterborne Transport Infrastructure (PIANC), 2014; *Dredging and Port Construction: Interactions with Features of Archaeological or Heritage Interest*. Brussels: PIANC Secrétariat Général.

- Managing the Marine Historic Environment of Wales (Annex B – Draft) (NRW in conjunction with Cadw & RCAHMW)[333].

15.3 Assumptions, Limitations and Uncertainties

15.3.1 For the purposes of the assessment the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

15.3.2 Heritage data to inform the heritage resource for this chapter has relied upon available online sources. It is recognized that the online sources may not be up-to-date so there could be assets which have not been included for assessment in this chapter. A full Heritage Environment Record (HER) data search will be undertaken to inform further terrestrial and marine EIA assessments for the Proposed Development.

15.3.3 A heritage site visit and geophysical surveys have not been undertaken to inform this scoping chapter but will be carried out to inform the next stage of assessments as required.

15.3.4 A ZTV has not been taken into account to inform the heritage assessment at this stage. This will be applied as part of the further EIA assessment to inform visibility between heritage assets and the Site as well as their settings.

15.3.5 It is assumed that no physical works will be required within the Repurposed CO_2 Connection Corridor and the Existing Natural Gas Connection Corridor (subject to assessment of the safety case) with the exception of minor maintenance/upgrade works to be carried out from AGIs. While an appropriate baseline for these aspects of the Proposed Development has been identified in Section 15.4, these aspects are not considered further within this assessment.

15.4 Baseline Conditions

15.4.1 The heritage assessment in this chapter considers the historic resource within both the terrestrial and marine environment. The terrestrial environment extends to the MHWS from which point cultural heritage in the marine environment is considered. This chapter describes the methodology and datasets used to inform the cultural heritage scoping assessment to identify the historic character of the area and the key heritage receptors within it. It provides an overview of the baseline conditions, the likely significant effects that may arise as a result of the Proposed Development, and how these likely significant effects will be assessed for the purpose of an EIA.

Study Area

15.4.2 The study area for terrestrial and marine cultural heritage has been defined as the footprint of the Site plus a buffer area of 1 km from the Site Boundary. Additionally, high value historic assets (see **Table 15-1** in Section 15.1) have been included up to 5 km where these are considered relevant to the assessment (see **Figure 15-1 and Figure 15-2 (Appendix A)**). This study

[333] RCAHMW, 2019; *Wales and the Sea - 10,000 Years of Welsh Maritime History*. Aberystwyth: RCAHMW and Y Lolfa.

area has been selected as proportionate to the nature of the Proposed Development and the topography of the area around the Site and across the Dee Estuary which falls partially into the English county of Cheshire, to inform the historic environment baseline by reference to relevant guidance and based on professional judgment.

Sources of Information

15.4.3 The baseline data reviewed to inform the terrestrial and marine cultural heritage resource includes the following sources:

- Lle, Geo-Portal for Wales (Lle, 2023);
- National Monuments Record of Wales (NMRW; Royal Commission on the Ancient and Historical Monuments of Wales; RCAHW, 2023);
- Clwyd-Powys Archaeological Trust HER data from Archwilio Historic Environment Records of Wales website (Clwyd-Powys Archaeological Trust, 2023);
- Cheshire HER data via heritage gateway website (Cheshire Archaeology, 2023);
- National Heritage List for England (NHLE) Data (Historic England, NHLE, 2023);
- Wreck Database, UKHO, 2023;
- BGS GeoIndex Offshore, BGS, 2023; and
- Archaeological fieldwork reports in relation to the Hynet Carbon Dioxide Pipeline DCO.

15.4.4 The potential for submerged archaeological assets such as palaeolandscapes and prehistoric remains was assessed using relevant available public literature and baseline knowledge.

15.4.5 Further contextualization where required was completed using relevant mapping including Admiralty Charts, historic maps and OS, Data Map Wales, Welsh Research Frameworks and relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeological Data Service and other websites.

Overview of Terrestrial Baseline Environment

Designated Assets

15.4.6 There are three scheduled monuments, 13 listed buildings, and one conservation area located within the 1 km study area, none of which are located within the Site Boundary. Between 1 km and 5 km, there are a further 18 scheduled monuments, 23 Grade I and II* listed buildings, and two Grade II* registered parks and gardens. The designated assets are listed in a gazetteer in **Appendix C** and shown on **Figure 15-1 (Appendix A)**. The gazetteer includes all of the designated historic assets within the 1 km study area as well as high value designated assets between 1 km and 5 km, comprising scheduled monuments, Grade I and Grade II* listed buildings and Grade I and II* registered parks and gardens.

15.4.7 The three scheduled monuments within 1 km comprise:

- Croes Atti Roman Site (FL213) located 150 m west of the Repurposed CO_2 Connection Corridor;
- Kelsterton Brewery (FL180) located 260 m south-east corner of the Main Site; and
- Pentre Bridge Roman Site (FL131) located 700 m north-west of the Repurposed CO_2 Connection Corridor.

15.4.8 The 13 listed buildings within the 1 km study area are all Grade II listed buildings of post-medieval date. These historic assets which have the potential to be impacted by the Proposed Development are:

- Kelsterton Hall (Cadw: 1), a large house located 130 m south-east of the Main Site.
- Leadbrook Hall (Cadw: 16409), a farmhouse located 160 m south-east of the Repurposed CO_2 Connection Corridor;
- Oakenholt Hall (Cadw: 355), a small country house within Oakenholt Conservation Area located 410 m south-west of the Main Site;
- Oakenholt Farmhouse (Cadw: 521), a 17th century cruck building within Oakenholt Conservation Area located 410 m south-west of the Main Site;
- Lychgate to Church of St Mark (Cadw: 85260), 300 m south-east of the Indicative Enhancement Area;
- Church of St Mark (Cadw: 85254), 320 m south-east of the Indicative Enhancement Area;
- The Vicarage (Cadw: 85265), located 340 m south-east of the Indicative Enhancement Area;
- Former Stable Block & attached boundary walls (Cadw: 85258), located 330 m south-east of the Indicative Enhancement Area;
- Old Quay House Inn (Cadw: 85262), located 470 m south-east of the Indicative Enhancement Area;
- Former Barn, Old Quay House Inn (Cadw: 85257), located 490 m south-east of the Indicative Enhancement Area;
- Dock Basin (Cadw: 85255) located 520 m south-east of the Indicative Enhancement Area;
- The Ship Public House (Cadw: 85264), located 830 m south-east of the Indicative Enhancement Area; and
- Waen Farmhouse (Cadw: 16408) 940 m south-west of the Proposed CO_2 Connection Corridor.

15.4.9 There are a number of conservation areas within the wider 5 km study area but only one within the 1 km study area:

- Oakenholt Hall Conservation Area located 320 m south-west of the access to the Main Site.

15.4.10 There are no registered parks and gardens located within the 1 km study area.

15.4.11 Designated historic assets of high significance within the wider 1 km to 5 km study area have been identified within this heritage assessment for the potential impact upon their setting by the Proposed Development. These include 18 scheduled monuments, 23 Grade I and II* listed buildings and two Grade II* registered parks and gardens. Conservation areas and other designated assets further than 1 km from the Site have been scoped out of this chapter due to their limited historical or visual connectivity such that the Proposed Development is unlikely to cause a significant effect upon their value. Further assessment of the high significance historic assets will be required as part of the EIA and are listed in the gazetteer in **Appendix C.**

Non-designated Assets

15.4.12 Desktop research has identified a large number of non-designated historic assets recorded by Clwyd-Powys Archaeological Trust on the Archwilio Historic Environment Records of Wales website.

15.4.13 Within the Site, five non-designated historic assets have been identified:

- Kelsterton Embankment (34227) is a post-medieval coastal protection bank which encloses the existing Connah's Quay Power Station. The construction of the new river crossing has destroyed part of the bank circuit. This is located at the north-eastern edge of the Main Site, close to the Water Connection Corridor.
- Within the eastern extent of the Main Site are two non-designated assets comprising a 20th century settling tank of (122661) and a purge pond (122656) of Connah's Quay reservoir, both modern reservoirs capable of holding more than 10,000 cubic meters of water.
- A former 19th century rifle range (129660), first recorded on the second edition OS map of 1899, was located at the west corner of the Indicative Enhancement Area and is no longer extant following development of the Deeside power station.
- Located within the Proposed CO_2 Connection Corridor is a possible marl pit recorded on the 1st edition OS map of 1871 (85035).
- There are also non-designated assets located on or just beyond the Site Boundary, including Rockcliffe Hall (89522) and Oakenholt Colliery (89524), both directly to the south-west of the Main Site.

15.4.14 Other nearby non-designated historic assets include the possible line of a Roman road beneath the A548 (104576) to the south of the Site. The Roman Road is thought to have run from Deva (Chester) to Varae in the Conwy valley.

15.4.15 Other non-designated historic assets within the study area include various archaeological and built heritage sites, indicating evidence of activity dating to the post-medieval and modern periods, including former and extant farms such as Little Leadbrook Farm (87992) located 90 m south-east of the Repurposed CO_2 Connection Corridor. Industrial remains are also recorded in the study area, such as limekilns (37773), quarries and pits (130907) and brickworks (103742), many concentrated in Connah’s Quay to the south-east.

Unknown Archaeological Resource

15.4.16 Findspots are recorded within the study area, providing indicative evidence for the potential of other similar as yet unknown archaeological remains to be present within the Site. Examples include a flint scraper (103009) located 280 m south of the access to the Main Site and a 1st century AD Roman coin (100135) discovered 70 m to the south-west of the Main Site.

15.4.17 Historic boreholes have been undertaken within the Site and surrounding area as recorded on the BGS online resource. The potential for palaeoenvironmental remains to be present is unknown although it is possible peat deposits will be present within the terrestrial environment alongside the estuary.

15.4.18 There is potential for archaeological features above the MHWS, such as preserved wooden structures, to remain present along the waterfront.

Previous Investigations

15.4.19 The Hynet Carbon Dioxide Pipeline DCO has an overlapping boundary with the Proposed Development, as it is partly situated within the Proposed CO_2 Connection Corridor. The geophysical survey carried out by Magnitude Surveys in February to March 2022 for this development included a fluxgate gradiometer survey covering land within the Proposed CO_2 Connection Corridor and directly to the south[334].

15.4.20 This survey recorded weakly positive, parallel linear anomalies, consistent with agricultural activity and linear anomalies representing drainage ditches aligned north-west to south-east within the southern end of the Proposed CO_2 Connection Corridor continuing to the south of the Site Boundary. A spread of industrial/ modern anomalies were also recorded at the south-western corner of the Proposed CO_2 Connection Corridor and a large area of magnetic disturbance at the centre of the Proposed CO_2 Connection Corridor.

15.4.21 An aerial photograph and LiDAR analysis conducted to inform the Hynet Carbon Dioxide Pipeline DCO ES chapter also recorded several features within the Proposed CO_2 Connection Corridor[335]. These consisted of a possible pit feature, approximately 5 m in diameter, at the south-eastern end of the Site (145) close to a possible L-shaped ditch, approximately 109 m in length. A 63 m long ridge aligned north-east to south-west was recorded to the north of these while a possible pit, approximately 2.7 m in diameter was recorded on the north-east side of the Site.

Ground Conditions

15.4.22 The Proposed Development is underlain by superficial deposits mainly consisting of Alluvium comprising grey-brown medium to coarse sand with occasional gravel, fragments of coal and shell and occasional bands of silt and laminated clays at depths of between 9.7 and 19.7 m below ground level as detailed in the RPS report. Beneath this is bedrock of Pennine Lower Coal Measures.

[334] Carrozzo, F, 2022; *Hynet North West Environmental Statement Appendix 8.4 Geophysical Survey*. Magnitude Surveys.
[335] WSP, 2022; *Hynet North West Environmental Statement, Appendix 8.3 Aerial Photograph and LiDAR review*

15.4.23 Made ground has been recorded within the Main Site during previous site investigations such as the North Site Evaluation Report, mainly comprising dark grey sandy clay and clayey sand with gravel and clinker with bands of dark grey PFA. The thickness of made ground ranged from 1.6 m to 4 m across the Main Site.

15.4.24 Crushed materials from the demolition of the former Connah's Quay Power Station in the Indicative Enhancement Area of the Site may have been used to raise site levels and fill in depressions. Previous investigations indicate an upper layer of 0.3 m to 2.4 m of granular made ground with occasional concrete, brick and ash overlying a layer of 1 m to 2.7 m of silty sandy made ground which is interpreted to be the sand dredgings from the 1960s.

Overview of Marine Baseline Environment

15.4.25 Marine archaeological and cultural heritage receptors located within the study area can be characterised as comprising four fundamental categories:

- seabed prehistory;
- maritime archaeology;
- aviation archaeology; and
- intertidal archaeology.

Designated Assets

15.4.26 There are no known archaeological features or sites located within the study area, including the remains of any aircraft, that are currently designated under the PWA 1973, PMRA 1986 or the AMAA Act 1979.

Seabed Prehistory

15.4.27 There are no known prehistoric receptors within the study area. However, features have been previously identified within the vicinity of the Proposed Development, including the presence of Palaeolithic cave sites in North Wales. Several studies have been undertaken within the Irish Sea that have provided an insight into the palaeogeography of the region, specifically relating to the terrestrial landscape that would have existed between the Devensian to Last Glacial Maximum (LGM) and the Holocene transgression[336],[337],[338]. There is therefore the potential for the presence of a preserved, post-LGM palaeolandscape within the study area.

15.4.28 On the basis of their age and rarity in a marine context, all *in situ* Palaeolithic and Mesolithic material are likely to be of high archaeological value and of national / international importance and where possible, should remain undisturbed.

Maritime Archaeology

15.4.29 Maritime archaeological sites can be considered to comprise two broad categories; the remains of vessels that have been lost as a result of

[336] Bicket, A. and Tizzard, L., 2015; A review of the submerged prehistory and palaeolandscapes of the British Isles, *Proceedings of the Geologists' Association* 126/6: 643-663.
[337] Lynch, F., Aldhouse-Green, S., and Davies, J.L., 2000; *Prehistoric Wales*. Stroud: Sutton Publishing
[338] Flemming, N.C., 2005; *The Scope of Strategic Environmental Assessment of Irish Sea Area SEA6 in regard to Prehistoric Archaeological Remains*. Crown copyright

stranding, foundering, collision, enemy action and other causes (e.g. shipwrecks), and those sites that consist of vessel-related material including jetsam, flotsam, lagan and derelict. Vessel-related material includes (but is not limited to) equipment lost overboard or deliberately jettisoned, such as fishing gear, ammunition and anchors, or the only surviving remains of a vessel such as its cargo or a ballast mound.

15.4.30 Shipwrecks on the seabed provide an insight into the types of vessels used in the past, the nature of shipping activity in the wider area and the changing usage of the marine environment through different periods. Such remains are considered more likely in sediments which promote the preservation of wreck sites (e.g. finer grained sediments that are not subject to high levels of mobility), particularly where such sediments have seen limited, recent disturbance.

15.4.31 There are no maritime archaeological records listed by the UKHO and the NMRW located in the study area.

15.4.32 There is potential for both unknown, unrecorded vessels and reported but unlocated losses to have sunk in the marine area of the Proposed Development over many centuries, given its position along the banks of the River Dee.

15.4.33 Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by the UKHO and others, and thus recorded in the archaeological record. However, there is still potential for discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey.

15.4.34 Maritime heritage from these periods may relate to a range of important themes in the history and heritage of Wales including the expansion in trade in various Welsh commodities such as copper, coal, slate and other stone trades, and associated port developments. The Welsh slate industry, while having a mainly 19th and 20th century focus, has a history which stretches back as far as the Roman period at least. The extraction of slate can be seen as a consistent exploitation of an available resource throughout Wales' entire historic period. The impacts of the industry highlight its importance to the cultural heritage of Wales. It changed the landscape of North Wales, resulting in its development and a marked change in its demographics in the 19th century. It preserved communities in that area sustaining their populations while many rural areas throughout the rest of the UK were being abandoned in favour of cities[339]. These themes are important baseline context to be considered in subsequent baseline assessment.

Aviation Archaeology

15.4.35 Marine aviation archaeology receptors comprise the remains or associated remains of military and civilian aircraft that have been lost at sea[340]. Evidence is divided into three primary time periods based on major

[339] Wessex Archaeology, 2009; *Ormonde Offshore Windfarm Project, Archaeological Assessment of Geophysical Data*. Unpublished report, ref. 72390.02. Salisbury: Wessex Archaeology.
[340] Wessex Archaeology, 2008; *Aircraft Crash Sites at Sea: A Scoping Study. Archaeological Desk-based Assessment Final Report*, Report ref 66641.02. Prepared for English Heritage. Salisbury: Wessex Archaeology.

technological advances in aircraft design: Pre-1939; 1939 to 1945; and post-1945.

15.4.36 There are no known aviation archaeology receptors within the study area. The local area contained a number of Royal Air Force (RAF) bases, including RAF Hawarden, RAF Wrexham, RAF Sealand and the more distant RAF Prestatyn. They were home to fighter squadrons protecting the docks and industry around Liverpool as well as training squadrons and the important Broughton aircraft factory which built over 5,500 Wellington bombers during the Second World War. Within the wider Dee Estuary there are a number of Recorded Losses of aircraft, the majority of which relate to the Second World War. There is therefore the potential for aviation archaeology, particularly related to the 1939 to 1945 period from both Allied aircraft and Axis bombers and fighter escorts attacking Liverpool, Broughton and other industrial areas. This potential is somewhat lessened by the study area's location close to shore where it is more likely that any crash would be identified and located.

15.4.37 Maritime aircraft crash sites can retain a significant amount of material, whilst being an ephemeral target to identify in survey datasets, with the potential for *in situ* human remains.

15.4.38 The remains of crashed military aircraft are protected under the PMRA 1986 and cannot be disturbed without a license.

Intertidal archaeology

15.4.39 There are no sites listed by the UKHO and RCAHMW datasets that fall within the intertidal zone of the Site, an area of reclamation. Within the wider study area there is a single record for a post-medieval breakwater (PRN 34226) at White Sands, on the northern bank of the River Dee. There may be a low potential for submerged prehistoric remains and landscapes beneath made ground.

Planned Surveys and Further Work to Establish the Baseline

15.4.40 To further inform the cultural heritage assessment at the PEIR and ES stage of the EIA process, further work will be undertaken to establish the baseline including:

- a full HER search requested from Clwyd-Powys Archaeology Trust;
- a heritage site walkover on both the Welsh and English sides of the Dee Estuary to review the terrestrial and marine historic environment;
- consultation with heritage stakeholders;
- a setting assessment of key heritage receptors on both the Welsh and English sides of the Dee Estuary;
- production of a cultural heritage desk-based assessment with a marine archaeological desk-based survey and archaeological review of marine geophysical surveys and geotechnical datasets, to identify marine historic assets; and

- archaeological fieldwork may be required, subject to consultation, such as geophysical survey, trial trench evaluation and geoarchaeological investigation.

15.5 Impact Assessment Methodology

15.5.1 Assessment of effects related to impact and setting change for identified terrestrial historic receptors will be undertaken at PEIR and ES stage using the staged approach laid out in the Cadw (2017) Setting Guidance and articulated with reference to Cadw's 2011 Conservation Principles. This will be used in conjunction with national planning policy and the relevant policies from Local Development Plans as well as guidance published by the Chartered Institute for Archaeologists.

15.5.2 The approach adopted for the EIA will follow that outlined within **Chapter 4: Project Alternatives and EIA Methodology**

Establishing the Baseline

15.5.3 Terrestrial archaeology, built heritage and historic landscape will be scoped into the EIA due to the potential for the Proposed Development to affect designated and non-designated historic assets, as well as potential archaeological remains and deposits.

15.5.4 Marine archaeology will be scoped into the EIA due to the potential for the Proposed Development to affect unknown historic assets within previously undisturbed sediment during the construction phase, associated with potential direct physical impacts from piling and cofferdam construction.

15.5.5 The ES chapter will establish the baseline conditions for the cultural heritage resource and assess the significance of the historic assets within the Proposed Development as well as the study area as relevant.

15.5.6 A 1 km study area for designated and non-designated historic assets has been applied to identify the key heritage receptors in this scoping chapter. Where required, designated historic assets beyond this will be included to assess the impact from changes to the asset's setting. In accordance with requirements specified in Planning Policy Wales, Note 24[341], the Cultural Heritage ES chapter will be compiled using data from the following sources:

- Records held by Cadw on designated historic assets;
- Designated historic assets held by National Heritage List for England;
- HER data requested from Clwyd-Powys Regional HER;
- Information held by FCC;
- Information held by Cheshire County Council;
- Records from the National Monuments Record of Wales, held by RCAHMW;
- Historic and current OS mapping;
- Historic and recent digital aerial photography;

[341] Cadw, Welsh Government, 2017; *Technical Advice Note 24: The Historic Environment* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2018-09/tan24-historic-environment.pdf

- LIDAR data; and
- Available Borehole and geological data from online data (British Geological Society website).

15.5.7 An assessment of the marine environment will be conducted to identify any possible (as well as known) marine heritage within the Proposed Development. It would include potential marine historic assets, as there could be assets of moderate and high heritage value present. The importance of marine historic environment assets would be evaluated to inform the assessment. The level of importance assigned depends on a number of factors, based on the guidance outlined above, as well as the following:

- Ships and Boats: Prehistory to Present. Designation Selection Guide[342]; and
- Assessing Boats and Ships 1860-1913, 1914-1938 and 1939-1950[343].

15.5.8 The assessment will address the identification of any marine historic assets on the seabed, so that avoidance of impact can be embedded in the project design, and if avoidance is not possible, then an evidence-based approach will be used to design suitable mitigation strategies in consultation with NRW and Cadw.

15.5.9 For marine archaeology impacts scoped in, the assessment will be based on analysis of desk-based sources (including GIS based gazetteer) and geophysical and geotechnical data collected specifically for the Proposed Development. Specific detailed methodology for the marine historic environment will be agreed in consultation with statutory stakeholders and curators.

Assessment Criteria

15.5.10 The value of a historic asset is guided by its designated status, but is derived also from its heritage interest, which may be evidential, historical, aesthetic or communal. The setting of a historic asset can also contribute to its value. Using professional judgment and the results of consultation, historic assets are also assessed on an individual basis and regional variations and individual qualities are considered where applicable. The value of a place is defined by the sum of its heritage interests.

15.5.11 Each historic asset relevant to the assessment is assigned a level of heritage value in accordance with the criteria set out in **Table 15-1**. These criteria have been developed using available guidance and professional judgement, taking into account regional variations and individual qualities where applicable. Where it is assessed that an asset is of greater or lower value than noted in the guidance table, justification will be provided.

Table 15-1 Criteria for Determining the Value of Heritage Assets

Value	Criteria
High	World Heritage Sites.

[342] English Heritage (now Historic England), 2012; *Ships and Boats: Prehistory to Present: Designation Selection Guide*. Swindon: English Heritage.
[343] Wessex Archaeology, 2011; *Assessing Boats and Ships 1860-1913, 1914-1938 and 1939-1950*, Archaeological Desk-Based Assessments in 3 volumes. Salisbury: Wessex Archaeology.

	Scheduled Monuments. Protected Wrecks Aircraft crash sites Grade I and II* Listed Buildings. Registered battlefields. Grade I and II* registered parks and gardens. Conservation areas of demonstrable high value. Non-designated historic assets (archaeological sites, historic buildings, monuments, parks, gardens, or landscapes) that can be shown to have demonstrable national or international importance. Well preserved historic landscape character areas, exhibiting considerable coherence, time-depth, or other critical factor(s).
Medium	Grade II Listed Buildings. Conservation areas. Grade II registered parks and gardens. Non-designated historic assets (archaeological sites, historic buildings, monuments, park, gardens, or landscapes) that can be shown to have demonstrable regional importance. Averagely preserved historic landscape character areas, exhibiting reasonable coherence, time-depth, or other critical factor(s). Historic townscapes with historic integrity in that the assets that constitute their make-up are clearly legible.
Low	Locally Listed Buildings. Non-designated historic assets (archaeological sites, historic buildings, monuments, park, gardens, or landscapes) that can be shown to have demonstrable local importance. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Historic landscape character areas whose value is limited by poor preservation and/ or poor survival of contextual associations.
Very Low	Assets identified on national or regional databases, but which have no evidential, historical, aesthetic and communal value. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Landscape with no or little significant historical merit.

Assessing the Magnitude of Impact

15.5.12 Once the value of the historic asset has been identified, the next stage in the assessment is to identify the level and degree of impact upon an asset arising from the Proposed Development. Impacts may arise during construction, operation or decommissioning phases of the Proposed Development and could be temporary or permanent, direct or indirect, or positive or negative. Impacts may occur to the physical fabric of an asset or may arise from changes within its setting. The assessment of the level and degree of impact will be made in consideration of any Proposed Development design mitigation (embedded mitigation). If no impact is likely, it is reported for the purposes of this assessment as ‘no change’. The level and degree of impact (impact rating) will be assigned with reference to a four-point scale as set out in **Table 15-2**.

Table 15-2 Criteria for Determining the Magnitude of Impact

Value	Criteria
High	Changes such that the heritage value of the asset is totally altered or destroyed.

	Comprehensive change to elements of setting that would result in harm to the asset and our ability to understand and appreciate its heritage significance.
Medium	Change such that the heritage value of the asset is significantly altered or modified. Changes such that the setting of the asset is noticeably different, affecting significance changes in our ability to understand and appreciate the heritage value of the asset.
Low	Changes such that the heritage value of the asset is slightly affected. Changes to the setting that have a slight impact on significance resulting in changes in our ability to understand and appreciate the heritage value of the asset.
Very Low	Changes that barely affect the value of the asset or its setting, resulting in no real change in the ability to understand and appreciate the asset.

Assigning the likely significance of effect

15.5.13 An assessment to classify the likely significance of the effect, having taken into consideration any embedded mitigation, will be determined using the matrix in **Table 15-3**.

15.5.14 The overall effect on the asset, caused by the impact, is determined by consideration of the value of the asset (**Table 15-1**) and the magnitude of the impact (**Table 15-2**), with a level of professional judgement included in the determination. This is identified by the degree of change that would be experienced by the asset and its setting if the Proposed Development were to be completed as compared with a 'do nothing' situation. Effects can be neutral, adverse or beneficial.

15.5.15 Residual major or moderate effects are deemed to be 'significant' for the purposes of the EIA Regulations, in accordance with standard EIA practice. Minor and negligible effects are deemed to be 'not significant' and may not be important or relevant to the decision-making process, although they may be matters of local concern.

Table 15-3 Matrix Used to Determine the Likely Significance of Potential Effects

		Magnitude of Potential Impact			
		High	Medium	Low	Very Low
Value of Historic asset	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible
	Very Low	Minor	Negligible	Negligible	Negligible

Buried Archaeological Potential

15.5.16 Buried archaeological evidence is often an unknown quantity which can be difficult to fully identify. The likelihood of the presence of unknown archaeological assets is assessed on known baseline evidence, but the physical nature and extent of any archaeological resource surviving within the Site cannot be fully confirmed without further baseline assessment and fieldwork investigation.

15.6 Embedded Mitigation

15.6.1 The following standard embedded mitigation practices, will be applied where necessary:

- avoidance of known historic assets (preservation in situ):
  - implementation of Archaeological Exclusion Zones (AEZ) around identified terrestrial archaeological remains; and
  - micro-siting of design to avoid known, terrestrial and marine historic assets as appropriate.
- development of and implementation of an Archaeological Written Scheme of Investigation (WSI) that will detail further mitigation measures:
  - archaeological WSI will also include a project-specific Protocol for Archaeological Discoveries (PAD) for items of unexpected and the reporting of unexpected discoveries in accordance with 'Protocol for Archaeological Discoveries: Offshore Renewables[344], which is used as best practice guidance.

15.6.2 Informed by the results of the DBA and any field evaluation, mitigation may comprise the preservation of archaeological remains through limited re-design or, where this is not practicable or appropriate, archaeological excavation.

15.7 Potential Effects

Construction

15.7.1 Potential temporary construction impacts that would last for all or part of the construction phase of the Proposed Development could include the following:

- the presence of construction plant, construction compounds and cable laydown areas temporarily altering the setting of receptors during the construction of the Proposed Development, including temporary visual intrusion, an increase in noise, lighting and vibration from construction vehicles, and / or an increase in dust and pollution. Impacts would result in changes in the landscape around the asset, which could reduce the value of the asset;
- direct impacts on known and potential marine cultural heritage receptors as a result of in-river construction works including physical damage during piling and cofferdam construction; and
- indirect impacts to marine heritage receptors due to altered sediment or hydrological processes, for example phsyical damage via erosion and scour or destabilisation of preservation conditions due to changes in protective sediment cover.

15.7.2 Potential permanent construction impacts lasting beyond the construction phase could include permanent irreversible truncation, compaction or loss of

[344] The Crown Estate, 2014; *Protocol for Archaeological Discoveries: Offshore Renewables Projects*, Wessex Archaeology Ltd for The Crown Estate.

known and unknown archaeological remains and deposits as a result of construction groundworks associated with the Proposed Development.

Operation

15.7.3 Potential impacts during the operation of the Proposed Development could include:

- the presence of infrastructure or plant screening during the life of the Proposed Development's operation, after the active construction phase has been completed, which may cause changes or alterations to the setting of historic assets or the historic landscape, which may be beneficial or adverse. These impacts are long-term for infrastructure, or permanent in respect of planting, for the operational duration of the Proposed Development but are reversible;
- other impacts may occur from the operation of the Proposed Development, which may include those experienced from security lighting, operational noise and associated traffic;
- direct impacts on known and potential marine cultural heritage receptors and deposits of archaeological importance as a result of operational activities and maintenance dredging; and
- indirect impacts to known and potential marine cultural heritage receptors due to altered sediment or hydrological processes.

Decommissioning

15.7.4 Potential impacts during the decommissioning of the Proposed Development could include:

- the potential for temporary setting impacts during the removal of the infrastructure, including foundations and hard surfacing;
- the setting of historic assets which have been impacted by the Proposed Development will be restored to previous baseline conditions, other than those where planting will remain as a permanent fixture in the landscape;
- direct impacts on known and potential marine cultural heritage receptors as a result of decommissioning; and
- indirect impacts to marine heritage receptors due to altered sediment or hydrological processes.

15.8 Additional Mitigation

15.8.1 Owing to the nature of the Proposed Development, it is envisaged that additional mitigation is likely to focus on addressing adverse likely significant effects to heritage assets, particularly buried archaeological assets. The approach to mitigation will be guided by industry common practice and appropriate procedures as laid out in the relevant standards and guidance documents from CIfA.

15.9 Summary of Potential Likely Significant Effects

15.9.1 In terms of the terrestrial heritage environment, designated historic assets within the study area may experience a change in their setting from the construction of the Proposed Development, which may cause potentially likely significant effects. There is potential intervisibility between the assets and the Proposed Development due to the height of the buildings as well as the topography. High value designated assets within 5 km (scheduled monuments, Grade I and II* listed buildings and Grade I and II* registered parks and gardens) will be scoped into the ES assessment. In addition to the historic assets outlined in Paragraph 15.4.7 to 15.4.9, these include, but are not limited to, the following:

- Castell y Fflint scheduled monument (FL003) and Grade I listed building (Cadw 16403) located 1.9 km north-west of the Repurposed CO_2 Connection Corridor;
- Promontory fort on Burton Point 550 m south-west of Burton Point Farm scheduled monument (NHLE 1013298) located 1.6 km north-east of the Existing Natural Gas Connection Corridor;
- Moel y Gaer Camp scheduled monument (FL011) located 4.3 km south-west of the Proposed CO_2 Connection Corridor;
- Church of St Eurgain and St Peter, Northop Grade I listed building (Cadw 321), located 2.3 km south-west of the Proposed CO_2 Connection Corridor; and
- Church of St Mary, Halkyn, Grade I listed building (Cadw 542) is located 4.2 km north-west of the Proposed CO_2 Connection Corridor.

15.9.2 There is potential for physical impacts to four non-designated assets and other known and unknown archaeological remains and deposits during construction of the Proposed Development. Extant and buried remains may be truncated, compacted or lost during construction of the Proposed Development resulting in likely significant effects.

15.9.3 In terms of the marine environment, there is the potential for impacts on previously undisturbed sediments from, piling and the construction of a cofferdam which have the potential to result in likely significant effects on known and unknown assets, and therefore will be scoped into the ES.

15.9.4 A summary of the potential likely significant effects to be scoped in or out of the ES is provided in **Table 15-4** below:

Table 15-4 Summary of the potential likely significant effects to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Terrestrial Cultural Heritage			
Construction	Designated historic assets within 1 km and high value designated assets within 5 km; non-designated built heritage within 1 km of the Site.		
	Archaeological remains and deposits, including peat and other palaeoenvironmental deposits, within 1 km of the Site.		
Operation	Designated historic assets within 1 km and high value designated assets within 5 km, non-designated built heritage within 1 km. Historic landscape within 1 km.	Buried archaeology.	There is not expected to be any potential impacts to buried archaeology during the operational phase of the Proposed Development as any impacts will have occurred during the construction phase. Archaeology has therefore been scoped out of the assessment at the operation phase.
Decommissioning	Designated historic assets within 1 km and high value designated assets within 5 km, non-designated built heritage within 1 km. Historic landscape within 1 km.	Buried archaeology.	There is not expected to be any potential impacts to buried archaeology during the decommissioning phase of the Proposed Development as any impacts will have occurred and been mitigated during the construction phase. Archaeology has therefore been scoped out of the assessment at the decommissioning phase.
Marine Cultural Heritage			

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Construction		Direct impacts on known and potential marine cultural heritage receptors on previously disturbed sediment as a result of construction.	Impact of construction activities will be on mobile intertidal sediments which have been disturbed by installation of the original outflow. Similarly, impacts from construction vessel movements are considered to be localised and temporary, and the magnitude of change is assessed as negligible, as no known maritime heritage has been identified within the Site.
	Direct impacts on known and potential marine cultural heritage receptors on previously undisturbed sediment as a result of construction.		
		Indirect impacts to marine heritage receptors due to altered sediment or hydrological processes.	As a result of the assessment of changes to hydrodynamics and sedimentary processes which predicts a low/negligible exposure to change (**Chapter 14: Physical Processes**) the magnitude of indirect impacts to marine cultural heritage receptors during the construction phase is expected to be negligible.
Operation		Direct impacts on known and potential marine cultural heritage receptors and deposits of archaeological importance as a result of operational activities and maintenance dredging.	As maintenance dredging, if required, will take place in areas where the dredging impact has already occurred, there is unlikely to be further impact.
		Indirect impacts to known and potential marine cultural heritage receptors due to altered sediment or hydrological processes.	As a result of the assessment of changes to hydrodynamics and sedimentary processes which predicts a low/negligible exposure to change (**Chapter 14: Physical Processes**)

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
			the magnitude of indirect impacts to marine cultural heritage receptors during the operation phase is expected to be negligible.
		Scoped out	There is not expected to be any potential impacts to buried marine archaeology during the decommissioning phase of the Proposed Development as any impacts will have occurred and been mitigated during the construction phase. Archaeology has therefore been scoped out of the assessment at the decommissioning stage.

16. Socio-Economics, Recreation and Tourism

16.1 Introduction

16.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on socio-economics, recreation and tourism. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development. The chapter considers:

- the present-day socio-economic, recreation and tourism conditions in the vicinity of the Proposed Development;
- the relevant policy at a national, regional and local level for the Proposed Development; and
- the potential effects of the Proposed Development on socio-economic conditions, recreation and tourism during the construction, operational and decommissioning phases.

16.1.2 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report.

16.2 Legislation, Policy and Guidance

16.2.1 A summary of the relevant national and local planning policy to socio-economics, recreation and tourism is provided in this section.

National Policies

- The NP (Policies 1, 2, 5, and 7);
- PPW (Principles 1, 2, and 3);
- Net Zero Wales Carbon Budget 2 2021-2025 (2021)[345] (Policies 9 and 11);
- Build Back Better: Our Plan for Growth (2021)[346];
- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);

[345] Welsh Government, 2021; *Net Zero Wales Carbon Budget 2 (2021-2025)* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2021-10/net-zero-wales-carbon-budget-2-2021-25.pdf
[346] UK Government HM Treasury, 2021; *Build Back Better: Our Plan for Growth* [online]. Available at: https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth/build-back-better-our-plan-for-growth-html#build-back-better-our-plan-for-growth-at-a-glance

- Welcome to Wales: 2020-2025 (2020)[347]; and
- The UK's Integrated National Energy and Climate Plan (2020)[348] (Aims: Support the growth of the UK low-carbon economy and Invest in the UK workforce).

Regional Policies

- A Growth Vision for the Economy of North Wales (2016)[349];
- North Wales Regional Economic Framework (2021)[350]; and
- North Wales Energy Strategy (2020)[351].

Local Policies

- The Deeside Plan (2017)[352] (Objectives 1, 2, 3, and 4);
- The FCC: Council Plan (2022)[353] (Priorities 1, 2, 3, and 4); and
- FCC LDP (Theme: Delivering growth and prosperity).

16.3 Assumptions, Limitations and Uncertainties

16.3.1 For the purposes of the assessment the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

16.3.2 Data limitations mean that Gross Value Added by Industry (see Section 16.4) can only be accounted for two of the three geographies within the study area.

16.4 Baseline Conditions

16.4.1 This section covers the key socio-economic, tourism and recreational indicators that are relevant to this chapter. This will form the basis of establishing the sensitivity of the study area to the impacts resulting from the Proposed Development.

Study area

16.4.2 The study area is split into three geographies:

[347] Welsh Government, 2020; *Welcome to Wales: 2020-2025* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2020-02/welcome-to-wales-priorities-for-the-visitor-economy-2020-2025.pdf
[348] Department for Business, Energy and Industrial Strategy (now the Department for Energy Security and Net Zero), 2020; *The UK Government, UK's Integrated National Energy and Climate Plan* [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/991649/uk-integrated-national-energy-climate-plan-necp-31-january-2020.pdf
[349] North Wales Economic Ambition Board, 2016; *A Growth Vision for the Economy of North Wales* [online].
[350] Welsh Government, 2021; *North Wales Regional Economic Framework* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2021-12/north-wales-regional-economic-framework.pdf
[351] Ynni Energy Service, 2020; *North Wales Energy Strategy* [online].
[352] Flintshire Local Council, 2017; *The Deeside Plan*. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Business-AdviceGuidance/Deeside-Plan-A4-v13.2.pdf
[353] Flintshire County Council, 2022; *County Council Plan 2022-23* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Council-Democracy/Council-Plan-and-Well-Being-Objectives/Council-Plan-2022-23.pdf

- The Direct Impact Area, defined using a best-fit approach, consisting of three Lower Super Output Areas (LSOAs)[354];
- The Wider Impact Area, consisting of the Flintshire Local Authority; and
- The National comparator, Wales.

16.4.3 This section will therefore establish the baseline conditions relative to the Direct Impact Area in comparison to the Wider Impact Area and Wales.

Sources of Information

16.4.4 The data used to inform this baseline study consists of multiple sources:

- 2021 Census (Office for National Statistics (ONS))[355];
- The 2021 Business Register and Employment Survey (BRES)[356];
- Welsh Indicator of Multiple Deprivation 2019[357];
- Google Maps[358]; and
- StatsWales (Welsh Government)[359].

Demographics

16.4.5 The population of the Direct Impact Area is 5,779, approximately 3.7% of the Wider Impact Area's population of 154,962 and approximately 0.19% of Wales' 3,107,494 population. The Direct Impact Area has the greatest age 15 to 64 population (66%), compared to Wales and the Wider Impact Area's 62%. All three geographies have the same proportion of ages 0 to14 (17%). These statistics can be found in **Table 16-1**; they are also visualised in **Plate 16-1.**

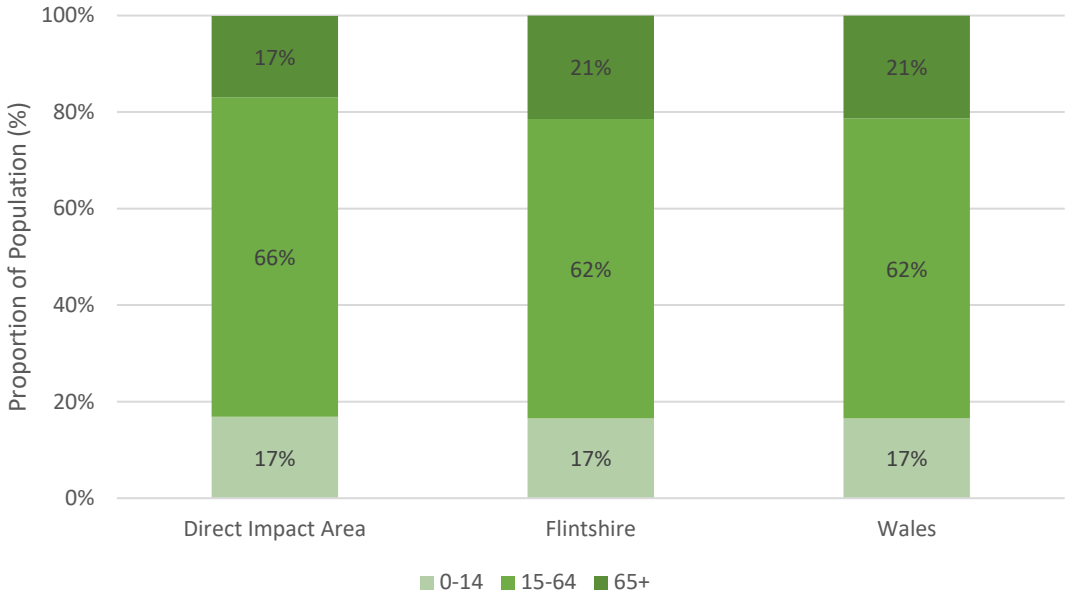
Table 16-1 Demographics

Area	Population	0-14	15-64	65+
Direct Impact Area	3,894	17%	66%	17%
Flintshire	154,962	17%	62%	21%
Wales	3,107,494	17%	62%	21%

Source: Census 2021, Number of usual residents in households and communal establishments, age by single year.

[354] LSOAs are a type of small geographical area that typically have a population of approximately 1,000 people. The Study area contains the following three LSOAs: W01000293, W01000294 and W01000275.
[355] ONS, 2022; *Census 2021* [online]. Available at: https://www.ons.gov.uk/census
[356] ONS, 2022; *Business Register and Employment Survey* [online]. Available at: https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey
[357] StatsWales, 2019; Welsh Index of Mutliple deprivation. Available at: https://statswales.gov.wales/Catalogue/Community-Safety-and-Social-Inclusion/Welsh-Index-of-Multiple-Deprivation
[358] Google, 2023; *Google Maps* [online]. Available at: https://www.google.co.uk/maps
[359] StatsWales, (2023). *StatsWales* [online]. Available at: https://statswales.gov.wales/Catalogue

Plate 16-1 Population Age Cohorts



Source: Census 2021, age by single year

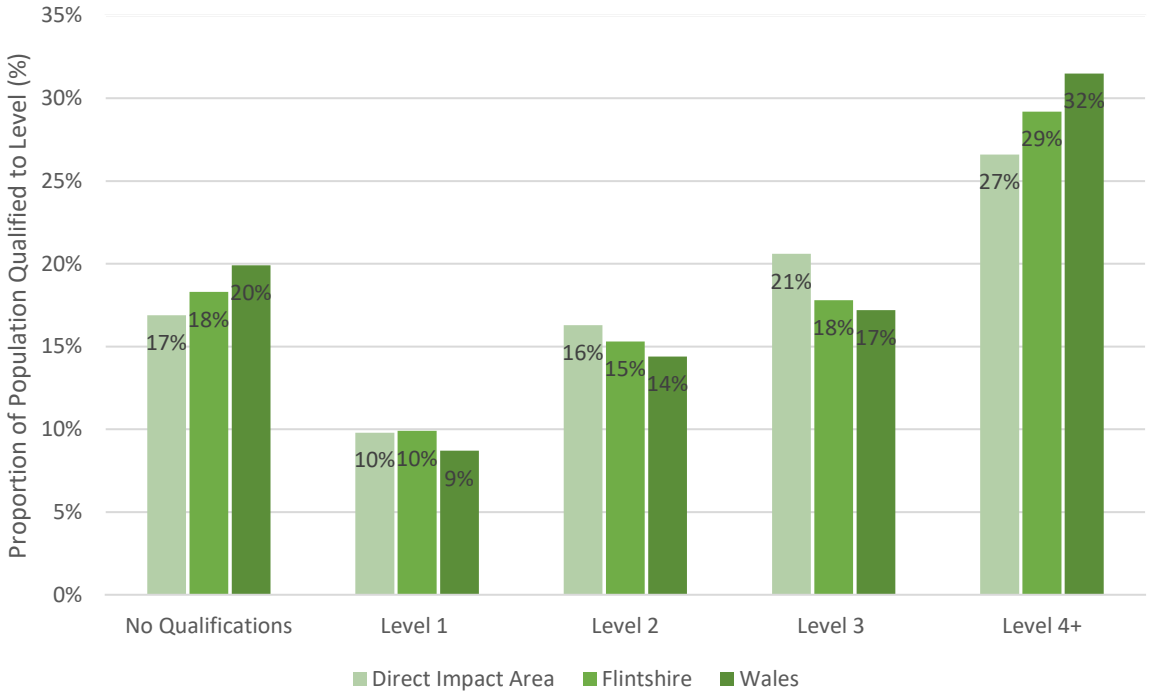
Qualifications

16.4.6 As shown in **Plate 16-2** the Direct Impact Area has the highest proportion of individuals qualified to level 1 (10%), level 2 (16%) and level 3 (21%)[360].The Direct Impact Area has the lowest proportion of individuals qualified to level 4+ (26%)[361], however it also has the lowest proportion of individuals with no qualifications (17%). Evidently, the Direct Impact Area has a fairly intermediate workforce, with not many highly qualified individuals but also not many individuals with no qualifications.

[360] Level 1 qualifications include 1 to 4 GCSEs grade A* to C, any GCSEs at other grades, O levels or CSEs (any grades), 1 AS level, NVQ level 1, Foundation GNVQ, Basic or Essential Skills. Level 2 qualifications include 5 or more GCSEs (A* to C or 9 to 4), O levels (passes), CSEs (grade 1), School Certification, 1 A level, 2 to 3 AS levels, VCEs, Intermediate or Higher Diploma, Welsh Baccalaureate Intermediate Diploma, NVQ level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First or General Diploma and RSA Diploma. Level 3 qualifications include 2 or more A levels or VCEs, 4 or more AS levels, Higher School Certificate, Progression or Advanced Diploma, Welsh Baccalaureate Advance Diploma, NVQ level 3; Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National and RSA Advanced Diploma.

[361] Level 4 and above qualifications include degree (BA, BSc), higher degree (MA, PhD, PGCE), NVQ level 4 to 5, HNC, HND, RSA Higher Diploma, BTEC Higher level and professional qualifications (for example, teaching, nursing, accountancy).

Plate 16-2 Qualifications



Source: Census 2021, highest level of qualification.

Education Infrastructure

16.4.7 The Direct Impact Area is located in an area with educational facilities nearby. A list of schools near the Direct Impact Area can be found in **Table 16-2**.

Table 16-2 Schools near the Direct Impact Area

Flintshire Schools
Coleg Cambria - Deeside
Golftyn Primary School
Connah's Quay High School
Ysgol Croes Atti Primary School
St Mary's Catholic Primary School
Ysgol Caer Nant

Source: Google Maps (2023).

Economic Activity

16.4.8 2021 Census data shows that in the Direct Impact Area, 65.6% of the population are economically active, which is much larger than both Flintshire (58.9%) and Wales (54.4%). The Direct Impact Area had the highest proportion of full-time employees (44.2%) and part-time employees (13%) compared to the other geographies. It had the lowest proportion of self-employed individuals (6.2%). Overall, the Direct Impact Area performs well in terms of economic activity, with the highest proportion of economically active individuals.

16.4.9 Unemployment rates were similar but differed between the three geographies; the Direct Impact Area and Flintshire had the lowest unemployment rate (2.3%) whereas in Wales unemployment was 2.5%. **Table 16-3** showcases the full set of economic activity data.

Table 16-3 Economic Activity

Economic Activity Status	Direct Impact Area	Flintshire	Wales
Economically Active (Excluding Full-time Students)	65.6%	58.9%	54.4%
Employee: Part-time	13.0%	11.9%	11.8%
Employee: Full-time	44.2%	37.3%	31.9%
Self-employed	6.2%	7.3%	8.2%
Unemployed	2.3%	2.3%	2.5%
Economically Active Full-time Student	2.0%	1.8%	2.2%
Economically Inactive	32.3%	39.4%	43.5%

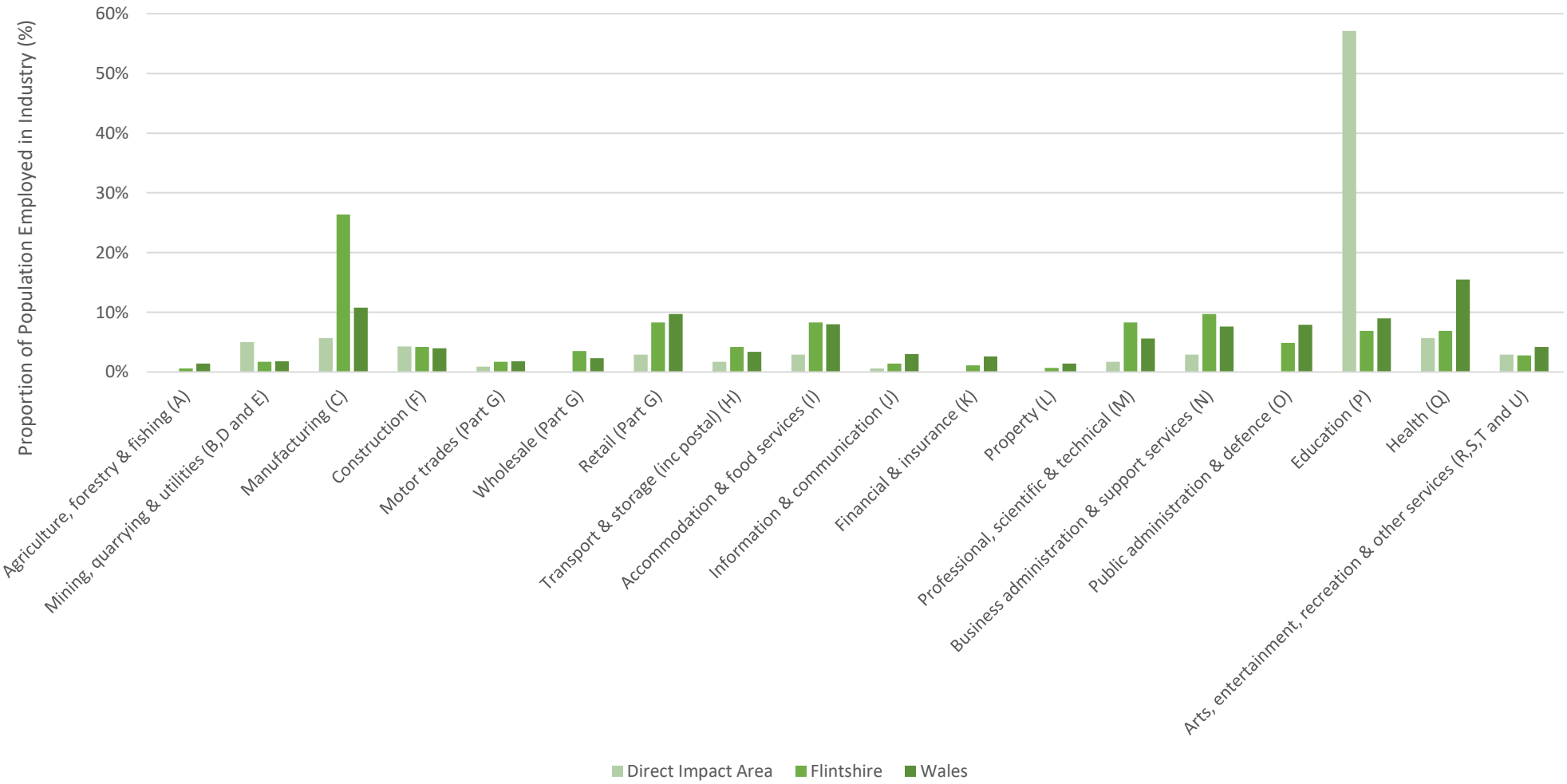
Source: Census 2021, economic activity status

Employment by Industry

16.4.10 The industrial group that employs the most people in the Direct Impact Area is the education sector (57%). The second largest industries are manufacturing and health with each providing 5.7% employment in the Direct Impact Area.

16.4.11 In comparison, only 9% of Wales' employment was in education (Sector P) and only 7% of Flintshire. The proportion of employment in manufacturing (Sector C) was, however, higher in Flintshire (26%) and Wales (11%). More industry employment data can be found in **Plate 16-3**.

Plate 16-3 Employment by Industry

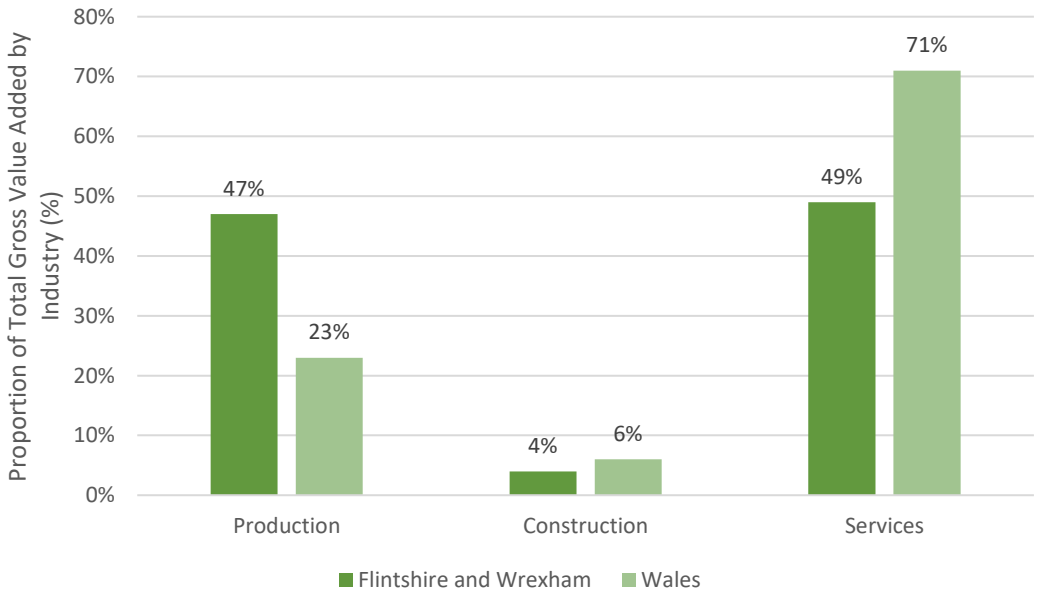


Source: BRES.

Gross Value Added (GVA) by Industry

16.4.12 Data for GVA is limited. Mean data is only available for Flintshire and Wrexham combined. Wales has a large proportion of its total gross value added in services (Sectors G, H, I, J, K, L, M, N, O, P, Q, R, S and T, refer to Plate 163 for description of sectors) with 71%, compared to Flintshire and Wrexham's 49%. Construction (Sector F) is the smallest proportion of total GVA in both geographies, with 6% in Wales and 4% in Flintshire and Wrexham. Production, consisting of Sectors A, B, C, D and E, is a higher proportion of total GVA in Flintshire and Wrexham compared to Wales; the percentages were 47% and 23% respectively. These statistics are shown in **Plate 16-4**.

Plate 16-4 GVA by Industry



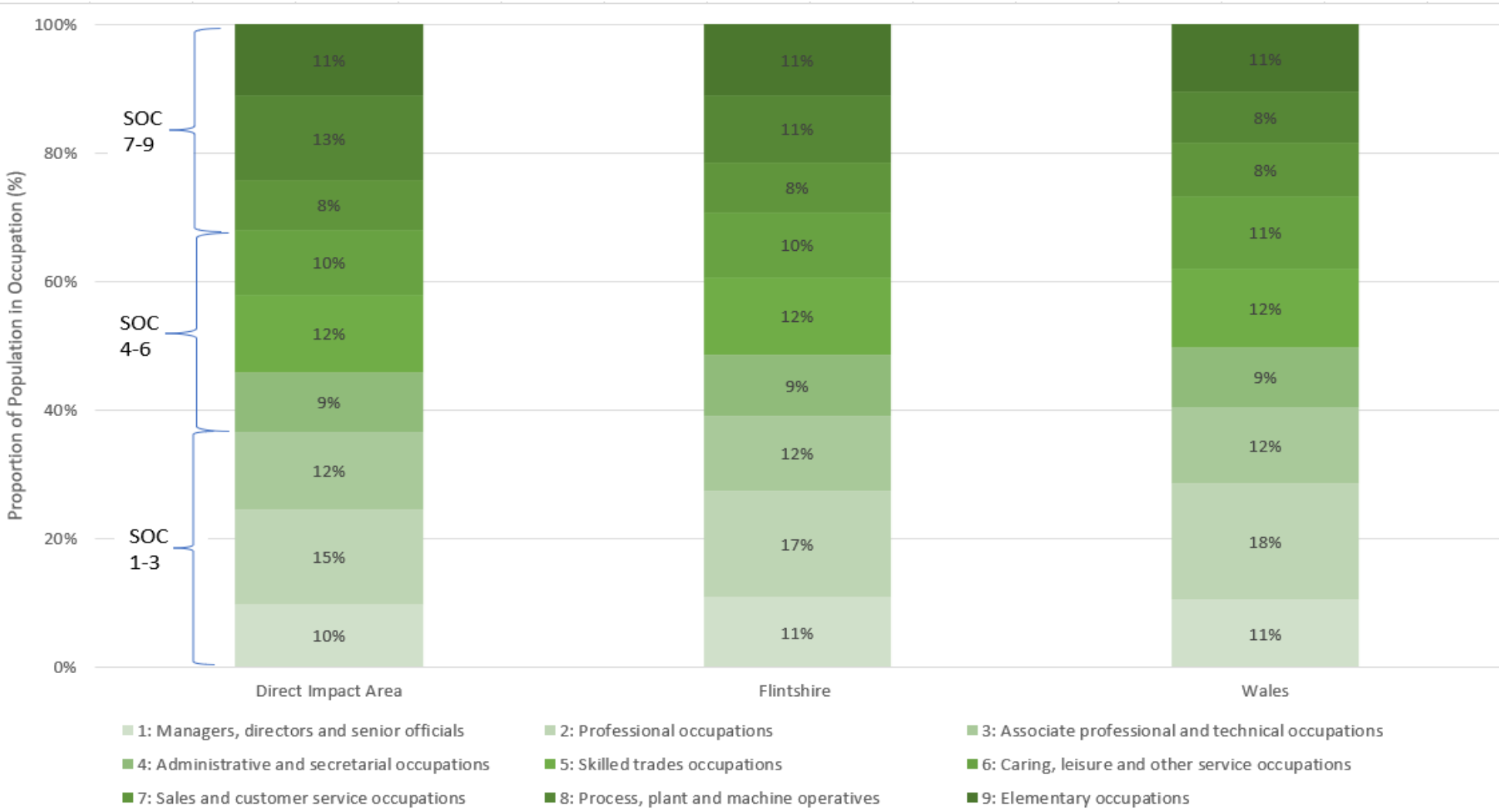
Source: StatsWales, ONS, gross value added in Wales by industry.

Occupations

16.4.13 In the Direct Impact Area, 15% of the population work in professional occupations (SOC code 2) and 13% in process, plant and machine operation occupations (SOC code 8)[362]. Comparatively, only 11% of Flintshire and 8% of Wales worked in process, plant and machine operation occupations; however, 17% of Flintshire and 18% of Wales worked in professional occupations. A full summary of the differences in occupations in the geographies can be found in **Plate 16-5**.

[362] Occupations refers to the nature of the employment role/occupation, whereas industry refers to the overall workplace that the occupation exists in.

Plate 16-5 Occupations



Source: Census 2021, occupation.

Deprivation

16.4.14 Flintshire overall has three LSOAs in the most deprived 10% of areas and 11 in the most deprived 20%. The Welsh Index of Multiple Deprivation scores range from 0 to 100, with 0 being the least deprived and 100 the most. The average score in Flintshire is 15.7; the LSOAs in the Direct Impact Area score 6.0, 10.1 and 23.5. Therefore, the Direct Impact Area as a whole falls in line with the average, with a slightly lower score of 13.2.

Tourism

16.4.15 The tourism sector in Flintshire was estimated to support 3,273 direct jobs in 2020 and generates £259 million annually from 3.7 million staying visitors and 2.7 million day visitors[363]. In Wales, the tourism industry supported 151,000 jobs in 2020. Tourism added £3.4 billion GVA to the Welsh economy in 2019[364]. **Table 16-4** displays some of the prominent visitor attractions located in the proximity of the Direct Impact Area.

Table 16-4 Visitor Attractions

Visitor Attraction	Approximate Distance to Site (km)
Flint Castle - Castell y Fflint	4.2
Ewloe Castle	3.5
Wepre Park	3.2
Oakenholt Farm	0.5
Connah's Quay Nature Reserve	0.1
Connah's Quay Central Park	2.5
The Pandy Fishing Pond	2.2
Cae Y Castell Football Stadium	3
Flint Town United Football Club & Social Club	3.2
Flint Foreshore	4
Hen Blas (motte and bailey castle)	5.7
Llwyni Valley Nature Reserve	3
Wepre Riverside Nature Reserve	2.5
Deeside Model Aircraft Club	1.6
Flintshire Bridge	1
Hawarden Golf Course	6.4

Source: Google Maps (2023)

[363] FCC, 2020; *Flintshire Destination Management Strategic Plan 2020* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Tourism/Flintshire-Destination-Management-Strategic-Plan-2020.pdf
[364] Welsh Government, 2020; *Wales Visitor Economy Profile: 2021* [online]. Available at: https://www.gov.wales/wales-visitor-economy-profile-2021-html

Public Rights of Way

16.4.16 A number of public rights of way (PRoWs) have been identified within the Direct Impact Area using the FCC's PRoW map[365]. The PRoWs identified are:

- 404/66/20;
- 404/66/10;
- 404/67/10;
- 302/28/30; and
- 302/28/20.

16.4.17 Further information on each of these routes is provided in **Chapter 8: Traffic and Transport**. Chapter 8 also provides information on any walking and cycling routes within the Direct Impact Area.

16.5 Impact Assessment Methodology

16.5.1 For socio-economics, there is no accepted definition of what constitutes a likely significant (or not significant) socio-economic effect. It is recognised that 'significance' reflects the relationship between the scale of impact (magnitude) and the sensitivity (or value) of the affected resource or receptor. As such, the significance criteria for socio-economic effects has been assessed using the expert judgement of authors with professional experience in socio-economics, and relies on the following considerations:

- the sensitivity of a given receptor: the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor, particularly their ability to respond to change based on the given impacts of the Proposed Development.
- the magnitude of the impact: this entails consideration of the size of the impact, for example, on people, businesses, users of Public Rights of Way (PRoW), private properties, employees and development land in the context of the area in which impacts will be experienced.

16.5.2 These factors have then been combined to determine the consequent likely significance of the effect.

16.5.3 The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. Socio-economic receptors for this assessment include:

- agricultural, industrial and development land;
- users of PRoW;
- private assets (including resident and business premises);
- visitor attractions;
- users of education and community facilities; and
- construction and decommissioning employees using temporary accommodation.

[365] FCC, 2023; *Public Rights of Way Map* [online]. Available at: https://rightsofway.flintshire.gov.uk/standardmap.aspx?NavigationPage=Page1

16.5.4 The criteria for assessing and classifying levels of receptor sensitivity used within the assessment are defined in **Table 16-5**, based on professional judgement.

Table 16-5 Sensitivity Classification

Level of Sensitivity	Description
High	There are limited/no comparable and accessible alternatives to the receptor that exist within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Medium	There are limited comparable and accessible alternatives to the receptor within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Low	Receptors are able to relatively easily absorb the change; and/or there are some comparable and accessible alternatives to the receptor that exist within the relevant catchment area.
Very low	Receptors are able to relatively easily absorb the change; and/or there are many comparable and accessible alternatives to the receptor that exist within the relevant catchment area.

16.5.5 The magnitude of the socio-economic impacts associated with the Proposed Development have been assessed as being high, medium, low or very low – these are defined in **Table 16-6**. The receptors detailed in the receptor sensitivity criteria are also considered for the magnitude criteria. This has been determined with regard to:

- Extent of change – the absolute number of people affected and the size of area in which the impact will be experienced (i.e. the level of change to baseline conditions including the proportion of the existing workforce);
- Scale of the impact – the relative magnitude of each impact in its relevant market context (for example, the impacts on local employment will be considered in the context of the overall size of the local labour market); and
- Duration of impact – more weight is given to long-term, permanent changes than to short-term, temporary ones. Temporary to short-term impacts are those associated with the construction works. Medium to long-term impacts are those associated with the operation of the Proposed Development.

Table 16-6 Magnitude Classification

Level of Magnitude	Description
High	An impact that is expected to have considerable adverse or beneficial socio-economics effects. Such impacts will typically affect large numbers of businesses, workers or residents.
Medium	An impact that will typically have a noticeable effect on a moderate number of businesses, workers or residents, and will lead to a small change to the study area's baseline socio-economic conditions.
Low	An impact that is expected to affect a small number of businesses, workers or residents or an impact that may affect a larger number of receptors but does not materially alter the study area's baseline socio-economic conditions.
Very Low	An impact which has very little change from baseline conditions where the change is barely distinguishable, approximating to a 'no change' situation.

16.5.6 To determine the overall significance of effects of the Proposed Development, effects have been defined in line with the following:

- Beneficial – advantageous or positive effect to an environmental resource or receptor;
- Negligible – imperceptible effect to an environmental resource or receptor;
- Adverse – detrimental or negative effects to an environmental resource or receptor; and
- No effect – no discernible effects on a receptor.

16.5.7 Duration of effect is also considered, with more weight given to permanent changes than to temporary ones. Permanent effects are generally those associated with the completed Proposed Development. Temporary effects are those associated with the construction works. For the purposes of this assessment, short-term effects are of one year or less, medium-term effects of one to five years and long-term effects for durations over five years.

16.5.8 Where an effect is assessed as being beneficial or adverse, the effect has been classified as Major, Moderate, Minor or Negligible. The assessment of significance is informed by considering the sensitivity of the receptor and the magnitude of impact as set out in **Table 16-7**. For the purposes of this assessment, only likely Moderate and Major effects are considered 'significant'.

Table 16-7 Significance of Effects Matrix

Magnitude of Impact	Sensitivity of Receptor			
	Very Low	Low	Medium	High
High	Minor	Moderate	Moderate	Major
Medium	Negligible	Minor	Moderate	Moderate
Low	Negligible	Negligible	Minor	Moderate
Very Low	Negligible	Negligible	Negligible	Minor

16.5.9 The assessment will be carried out using a number of recognised data sources and, wherever possible, the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes and Communities Agency (now Homes England). Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

16.6 Embedded Mitigation

16.6.1 Mitigation and measures for the construction and operational phases (some of which may have already been considered through the early development of the proposals) will be considered and key indicators for monitoring socio-economics impacts moving forward will be established.

16.7 Potential Effects

16.7.1 We anticipate the potential effects during the construction and decommissioning phases could include the following:

- temporary direct and indirect employment creation; both directly at the Main Site and indirectly in the supply chain;
- Positive GVA (gross value added) generation;
- the potential for the promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits;
- temporary or permanent disruption to traffic on the local and strategic road networks;
- temporary or permanent disruption to PRoW;
- impacts on businesses, visitor attractions and community facilities, either direct (demolition/land take) or indirect via in combination effects identified by other discipline assessments; and
- any land use impacts (such as effect on planned or proposed developments).

16.7.2 We anticipate the potential effects during the operation phase could include the following:

- permanent direct and indirect employment creation;
- the potential for the promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits;
- permanent disruption to PRoW;
- permanent impacts on businesses, visitor attractions and community facilities, either direct (land take) or indirect via in combination effects identified by other discipline assessments; and
- permanent land use impacts (such as on planned or proposed developments).

16.8 Additional Mitigation

16.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

16.9 Summary of Potential Likely Significant Effects

16.9.1 A summary of the potential effects to be considered in the ES is presented in **Table 16-8**.

Table 16-8 Summary of the Potential Likely Significant Effects to be Considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Socio-economics			
Construction	Temporary direct and indirect employment; promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits; temporary or permanent disruption to traffic on the local and strategic road networks; impacts on businesses either direct (demolition/land take) or indirect via in combination effects identified by other discipline assessments; and land use impacts (such as effect on planned or proposed developments).	No effects scoped out	N/A
Operation	Permanent direct and indirect employment creation; the potential for the promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits; permanent disruption to PRoW; permanent impacts on businesses, either direct (land take) or indirect via in combination effects identified by other discipline assessments; and permanent land use impacts (such as on planned or proposed developments).	Permanent disruption to traffic on the local and strategic road networks.	Table 8-5 of the Traffic and Transport Chapter scopes out operational traffic effects.
Decommissioning	Temporary direct and indirect employment; promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits; temporary or permanent disruption to traffic on the local and strategic road networks; impacts on businesses either direct (demolition/land take) or indirect via in combination effects identified by other discipline assessments; and land use impacts (such as effect on planned or proposed developments).	No effects scoped out	N/A

17. Climate Change

17.1 Introduction

17.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on the climate, and the impact of climate change on the Proposed Development. This has been informed by an overview of the environmental baseline conditions, along with any anticipated key issues likely to be associated with the Proposed Development.

17.1.2 To align with IEMA Guidance for assessing climate change mitigation[366] and adaptation[367], consideration will be given to the three aspects of climate change assessment identified in **Table 17-1**.

Table 17-1 Definition of the elements of the climate change assessment

Assessment Type	Definition
Lifecycle greenhouse gas (GHG) impact assessment	Impact of GHG emissions arising from the Proposed Development on the climate, including how it will affect the UK meeting its national carbon budgets.
Climate change resilience assessment (CCRA)	The resilience of the Proposed Development to climate change impacts, including how the design will consider projected impacts of climate change.
In-combination climate change impact (ICCI) assessment	The combined impact of the Proposed Development and potential climate change on receptors in the receiving environment.

17.1.3 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report. Other relevant related topic chapters include: **Chapter 6: Air Quality**; **Chapter 8: Traffic and Transport**; **Chapter 9: Terrestrial and Aquatic Ecology**; **Chapter 11: Water Environment and Flood Risk**; **Chapter 19: Major Accidents and Disasters**; **Chapter 20: Materials and Waste**; and **Chapter 21: Cumulative and Combined Effects**.

17.2 Legislation, Policy and Guidance

17.2.1 A summary of the relevant national, and local legislation and planning policy to assessment of effects on the climate and the assessment of climate change impacts is provided in this section.

[366] IEMA, 2022; *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance* [online]. Available at: https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance. [Accessed November 2023].
[367] IEMA, 2020; *Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation* [online]. Available at: https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020. [Accessed November 2023].

International

- United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement[368]

Legislation

- Climate Change Act 2008[369] (Part 1);
- The Climate Change Act 2008 (2050 Target Amendment) Order 2019[370] (Article 2);
- The Carbon Budget Order 2021[371] (Article 2);
- The Climate Change (Interim Emissions Targets) (Wales) (Amendment) Regulations 2021[372] (Article 2);
- Environment (Wales) Act 2016 (Part 2); and
- Well-being of Future Generations (Wales) Act 2015 (Part 2).

National Policy

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- PPW;
- Our Green Future: Our 25-year Plan to Improve the Environment (2018)[373];
- Net Zero Strategy: Build Back Greener (2021);
- Towards Net Zero Emissions (2021)[374];
- Transport Decarbonisation Plan, Decarbonising Transport: a better, greener Britain (2021)[375]; and
- British Energy Security Strategy (2021)[376].

[368] UNFCCC, 2016; *The Paris Agreement* [online]. Available at: https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf (Accessed 20/12/2023).
[369] *Climate Change Act 2008* (c. 27). London: HMSO.
[370] The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (SI 2019/1056). London: HMSO.
[371] *The Carbon Budget Order 2021* (SI 2021/750). London: HMSO.
[372] The Climate Change (Interim Emissions Targets) (Wales) (Amendment) Regulations 2021 (SI 2021/338) (W 92). London: HMSO.
[373] Department for Environment, Food and Rural Affairs, 2018; *Our green future: Our 25 year plan to improve the environment* [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf (Accessed 20/12/2023).
[374] Energy UK, (October 2021); Towards Net Zero Emissions - The energy industry's commitment to the climate, customers and jobs. Available at: https://www.gov.uk/government/publications/g7-climate-and-environment-ministers-meeting-may-2021-communique/climate-and-energy-commitments-to-action (Accessed 20/12/2023).
[375] Department for Transport, 2021; *Transport Decarbonisation Plan, Decarbonising Transport: a better, greener Britain* [online]. Available at: https://www.gov.uk/government/publications/transport-decarbonisation-plan (Accessed 20/12/2023).
[376] Department for Business, Energy and Industrial Strategy, 2021; *British Energy Security Strategy* [online]. Available at: https://www.gov.uk/government/publications/british-energy-security-strategy (Accessed 20/12/2023).

Local Policy

- FCC LDP (Policies: EN2: Green Infrastructure; STR14: Climate Change and Environmental Protection; STR13: Natural and Built Environment, Green Networks and Infrastructure; PC4: Sustainability and Resilience of New Development; EN12: New Development and Renewable and Low Carbon Energy Technology; and EN13: Renewable and Low Carbon Energy Development).
- FCC Climate Change Strategy 2022/23 – 2029/30[377]

Guidance

- IEMA: Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022) (IEMA Guidance (Climate Change));
- IEMA: Environmental Impact Assessment Guide to: Climate Chance Resilience and Adaptation (2020);
- GHG Protocol (2015)[378];
- Carbon Management in Infrastructure (PAS 2080) (2016)[379];
- DESNZ Emission Factors (2022)[380];
- Inventory of Carbon and Energy (ICE)[381]; and
- Think Hazard (2023)[382].

17.3 Assumptions, Limitations and Uncertainties

17.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

17.3.2 It is assumed that the start date of the GHG, CCRA and ICCI assessments will be the start of the construction period.

17.3.3 The temporal scope of the assessment will include construction, operation and decommissioning phases.

17.3.4 The design life of the Proposed Development is at least 30 years from 2030. UK Climate Projection 2018 (UKCP18) data is limited to the projected time period of 2100. The CCRA will consider climate variables up to 2100 to assess the impact of climate change over the lifetime of the Proposed Development.

[377] Flintshire County Council, 2023; *Climate Change Strategy 2022/23 – 2029/30* [online]. Available at: https://committeemeetings.flintshire.gov.uk/documents/s69422/Appendix%201%20-%20Climate%20Change%20Strategy%202022%20-%202030.pdf (Accessed 20/12/2023).
[378] World Resources Institute (WRI) & World Business Council for Sustainable Development (WBCSD), 2015; *The GHG Protocol', A Corporate Accounting and Reporting Standard*. Available at: https://www.wbcsd.org/Programs/Climate-and-Energy/Climate/Resources/A-corporate-reporting-and-accounting-standard-revised-edition (Accessed 20/12/2023).
[379] British Standards Institute, 2016; *Carbon management in infrastructure* [online]. Available at: https://shop.bsigroup.com/products/carbon-management-in-infrastructure/standard (Accessed 20/12/2023).
[380] DESNZ, 2023; *Greenhouse gas reporting: conversion factors*. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023 (Accessed 20/12/2023).
[381] University of Bath, n.d.; *Inventory of Carbon and Energy V3.0*. Available at: https://circularecology.com/news/inventory-of-carbon-energy-database-v3-progress-update (Accessed 20/12/2023).
[382] United Nations Office for Disaster Risk Reduction, 2023; *Think Hazard* [online]. Available at: https://www.thinkhazard.org/en/report/40110-united-kingdom-england-greater-london (Accessed 20/12/2023).

17.3.5 It is assumed that sufficient necessary quantitative data will be available to inform the carbon assessment. Where quantitative data is not available, reasonable assumptions will be made.

17.3.6 Where it is neither practicable to quantify the required data nor to use reasonable assumptions, a qualitative statement will be made on the environmental impact based on professional experience and expertise.

17.3.7 Good practice methods and guidance will be used in the assessments.

17.4 Baseline Conditions

17.4.1 This section provides a summary of the current baseline conditions used to inform and propose the scope of the climate assessment.

Study Area

17.4.2 The study area for the baseline of each assessment type is informed by the needs of the future assessment itself.

Lifecycle GHG Impact Assessment

17.4.3 The study area for the GHG assessment would include:

- direct GHG emissions arising through:
  - the required demolition of existing structures and as a result of pre-construction site clearance/ remediation;
  - construction activities;
  - operation and maintenance activities; and
  - decommissioning and dismantling activity within the Site.
- indirect GHG emissions occurring off-site that are significantly related to the Proposed Development, such as embodied carbon in materials, transportation, waste processing and waste disposal.

CCRA

17.4.4 The study area for the CCRA will be the area of temporary and completed works within the Site and surrounding areas.

ICCI

17.4.5 The study area for the ICCI assessment will be determined by the EIA topic assessments, as described in other chapters of this report and to be reported in the ES. The other relevant topic chapters may include:

- **Chapter 6:** Air Quality;
- **Chapter 8:** Traffic and Transport;
- **Chapter 9:** Terrestrial and Aquatic Ecology;
- **Chapter 11:** Water Environment and Flood Risks;
- **Chapter 19:** Major Accidents and Disasters;
- **Chapter 20:** Materials and Waste; and

- **Chapter 21:** Cumulative and Combined Effects.

Sources of Information

17.4.6 The principal data sources used to inform the current baseline conditions presented in this EIA Scoping Report comprise the following:

- existing operational emissions data within the Site;
- carbon stock information for soil and vegetation within the Site;
- historical climate data[383] obtained from the Met Office (Hawarden Airport, situated approximately 6 km from the Proposed Development) for the period 1981-2010, as listed in **Table 17-2**;
- UKCP18[384]; and
- climate hazards identified from Think Hazard.

Surveys

17.4.7 No surveys are required for the climate change assessment. All the necessary information can be accessed from desk-based sources.

Summary of existing baseline

Lifecycle Greenhouse Gas (GHG) Impact Assessment

17.4.8 For the GHG assessment, the baseline is the 'business as usual' scenario where the Proposed Development is not developed, and the existing Connah's Quay Power Station (and other existing assets within the Site) remains operational or are left in-situ. For the construction, operation and decommissioning of the Proposed Development, the receptor for GHG emissions is the global climate.

17.4.9 The GHG baseline will be established by identifying existing GHG emissions sources within the Site, assuming that the Proposed Development does not progress.

17.4.10 The baseline for the GHG assessment will include the GHG emissions associated with any operational emissions from existing infrastructure. Where data is available, this will be used to quantify carbon emissions. Where data is unavailable, benchmarks, estimates, or approximations will be used based on professional judgement.

Climate change resilience assessment (CCRA) and In-combination climate change impact (ICCI) assessment

17.4.11 The CCRA and ICCI will consider how resilient the Proposed Development and surrounding environment are to current and projected future climate hazards by identifying likely changes to the climate and potential climate hazards over the lifecycle of the Proposed Development. For all three phases (construction, operation and decommissioning) of the Proposed Development, the receptor for the CCRA is the Proposed Development itself

[383] Met Office, 2023; *UK Climate Averages* [Online]. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcmys019j (Accessed 14/12/2023).
[384] Met Office, 2018; *UK Climate Projections 2018 (UKCP18)* [Online]. Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/download-data (Accessed 14/12/2023).

and associated users, while the ICCI assessment receptors are defined by the technical specialists in the applicable technical chapters of this scoping report.

17.4.12 The Proposed Development (including workers, infrastructure and visitors) is integral to both assessments; the current baseline has been established by understanding the historical/ current climate in the location of the Proposed Development and surrounding environment by reviewing historic climate data obtained from the Met Office website (Hawarden Airport weather station, situated approximately 6.9 km away). Data from this station provides the baseline climate average for 1981-2010, as summarised in **Table 17-2.**

Table 17-2 Historical Climate Data for Connah's Quay 1981-2010

Climatic Variable	Baseline data 1981-2010
Mean annual maximum daily temperature (°C)	14.04
Warmest Month on Average (°C)	21.03 (July)
Coldest Month on Average (°C)	1.42 (February)
Mean annual rainfall (mm)	726.20
Wettest month on average (mm)	81.32 (October)
Driest Month on average (mm)	43.95 (February)

17.5 Impact Assessment Methodology

17.5.1 This section provides a summary of the Climate Change assessment methodology. The scope of assessment considers the impacts and resultant effects during all phases of the Proposed Development.

Future Baseline

17.5.2 A desk-based study will be undertaken to inform the future baseline characterisation on which the impact assessment will be based, in addition to the existing baseline outlined above.

17.5.3 No surveys will be required for the climate assessment. The principal data sources used to inform the future baseline conditions will be the same as those outlined above.

Lifecycle GHG Impact Assessment

17.5.4 The future baseline for the assessment of the impact of the Site on climate is a projected 'business as usual' scenario where the Proposed Development is not constructed and the Site is left in-situ.

CCRA and ICCI

17.5.5 The future baselines for construction, operation and decommissioning phases of the Proposed Development will be based on UKCP18 data from the Met Office for the 25 km grid square in which the Proposed Development is located. These are provided within **Table 17-3**.

Table 17-3 Climate Change Baseline and Projection Data

	Baseline data	Projection (change) across project life cycle				Projected Trend	Climate projection source
Climatic Variable	1981-2010	2020 – 2049		2040-2069			
		Construction (Phase 1 & 2)	Operation	Operation	Decommissioning		
Temperature							
Mean annual maximum daily temperature (°C)	14.0	+0.95 °C +0.39 °C to +1.52 °C)		+1.14 °C (+0.83 °C to +2.63 °C)		↑	UKCP18 RCP8.5
Mean annual minimum daily temperature (°C)	14.0	+0.91 °C (+0.35 °C to +1.51 °C)		+1.66 °C (0.76 °C to 2.64 °C)		↑	UKCP18 RCP8.5
Mean summer maximum daily temperature (°C)	20.2	+1.14 °C (+0.31 °C to +1.97 °C)		+2.09 °C (+0.79 °C to +3.43 °C)		↑	UKCP18 RCP8.5
Mean winter minimum daily temperature (°C)	1.5	+0.80 °C (+0.04 °C to +1.60 °C)		+1.52 °C (+0.41 °C to +2.68 °C)		↑	UKCP18 RCP8.5
Number of days of air frost per annum	42.8	-		-		-	Met Office
Highest temperature for baseline period (°C)	21.0 (July)	+1.27 °C (-0.10 °C to +2.63 °C)		+2.40 °C (+0.40 °C to +4.42 °C)		↑	UKCP18 RCP8.5
Lowest temperature for baseline period (°C)	1.42 (January)	+0.81 °C (-0.26 °C to +1.94 °C)		+1.61 °C (+0.02 °C to +3.31 °C)		↑	UKCP18 RCP8.5
Rainfall							
Mean annual rainfall (mm)	726.2	0.14% (-6.04% to +6.47%)		-2.73% (-10.04% to +4.64%)		↓	UKCP18 RCP8.5
Mean summer rainfall (mm)	57.6	-4.89% (-21.95% to +10.48%)		-17.24% (-39.05% to +3.92%)		↓	UKCP18 RCP8.5

	Baseline data	Projection (change) across project life cycle		Projected Trend	Climate projection source
Mean winter rainfall (mm)	59.8	+2.13% (-3.50% to +8.20%)	+4.56% (-3.59% to +13.69%)	↑	UKCP18 RCP8.5
Wettest month on average (mm)	81.3 (October)	+5.49% (-6.67% to +19.02%)	+12.64% (-3.08% to +31.33%)	↑	UKCP18 RCP8.5
Driest month on average (mm)	44.0 (February)	+3.56% *(-8.46% to 15.99%)	+6.69% (-9.62% to +23.62%)	↑	UKCP18 RCP8.5
Other					
Sea Level Rise (m)	0.11	0.17	0.31	↑	SSP5-8.5[385]
Storms	The UKCP18 model suggest a small contribution from storm surges; however, it is unclear if the frequency and severity of future storm surges is going to change. Rising sea levels due to climate change are expected to worsen the impacts of storm surges.			↑↓	UKCP18 RCP8.5
Droughts	The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a low one; however, it is the distribution of rainfall throughout the seasons that will determine UK drought risk.			↑	UKCP18 RCP8.5
Wildfires	The wildfire hazard is classified as medium according to the information that is currently available to the Think Hazard tool. This means that there is between a 10% and 50% chance of experiencing weather that could support a hazardous wildfire that may poses some risk of life and property loss in any given year.			↑	Think Hazard

Approach and Assessment Criteria – GHG Impact Assessment

17.5.6 The lifecycle GHG impact assessment will aim to quantify the GHG emissions over the lifecycle of the Proposed Development.

17.5.7 The assessment will adopt a project lifecycle approach to identify 'hot spots' of GHG emissions (i.e. the project stage(s) likely to generate the largest mass of GHG emissions) and enable priority areas for mitigation to be identified. This approach is consistent with the principles set out in IEMA Guidance (Climate Change).

17.5.8 In line with the World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) GHG Protocol guidelines, the lifecycle GHG impact assessment will be reported as tonnes of carbon dioxide equivalent (tCO_2e). It will consider the seven Kyoto Protocol gases:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Sulphur hexafluoride (SF_6);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Nitrogen Trifluoride (NF_3).

17.5.9 Expected GHG emissions arising from the construction and operation phases will be quantified using a calculation-based methodology as per the following equation and aligned with the GHG Protocol:

- Activity data × GHG emissions factor = GHG emissions.

17.5.10 The resulting carbon footprint will be compared to the existing and future baseline conditions.

17.5.11 If the relevant GHG activity data are unavailable, GHG emissions will be estimated based on benchmarks or approximations. Where quantification is not possible, the assessment may be qualitative. Any assumptions, inclusions and exclusions that inform the GHG emissions calculation will be clearly described.

Sensitivity

17.5.12 The global climate will be identified as the receptor for the purposes of the GHG assessment. The sensitivity of the climate to GHG emissions is 'high'. The rationale is as follows:

- GHG emission impacts could compromise the CCC's sectoral construction and net-zero pathways and, therefore, the ability to meet its future carbon reduction trajectory;
- GHG emission impacts could compromise the UK's ability to reduce its GHG emissions and, therefore, the ability to meet its future legally-binding carbon budgets;

- the extreme importance of limiting global warming to below 2 °C above industrial levels, while pursuing efforts to limit such warming to 1.5 °C as set out in the Paris Agreement and a recent report by the Intergovernmental Panel on Climate Change (IPCC)[386] highlighting the importance of limiting global warming below 1.5 °C; and
- disruption to global climate is already having diverse and wide-ranging impacts on the environment, society, economy, and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.

Magnitude of Impact

17.5.13 The DESNZ 2023 Emission Factors and embodied carbon data from the ICE V3.0 will be used as the source of emissions factors for calculating GHG emissions.

17.5.14 In GHG accounting, it is considered good practice to contextualise emissions against pre-determined carbon budgets. Therefore, in line with IEMA Guidance (Climate Change), the Proposed Developments emissions will be contextualised against the UK national[387] (**Table 17-4**) and Welsh (**Table 17-5**) carbon budgets as proposed by the CCC, agreed by government, and ratified by parliament and Senedd Cymru, respectively. This contextualisation will be applied in terms of both the sensitivity of the receptor and the magnitude of potential impacts, as appropriate.

17.5.15 To illustrate the Proposed Development's progress towards net zero trajectory by 2050, it is recommended that the CCC balanced net-zero pathway is utilised (post-2037) in the absence of any national, legally-binding carbon budgets, after using the subsequent 6th Carbon Budget. Beyond 2050, it is expected that the UK will remain at net zero.

17.5.16 The CCC balanced net-zero pathway is divided into 5-year periods post-2037 to match the previous 1-6 legally-binding UK national carbon budgets. The proposed Carbon Budget periods derived from the net-zero pathway encompass the 7th, 8th, and 9th indicative budget periods up to 2050 in line with the UK's 1.5-degree trajectory as detailed in **Table 17-4**.

17.5.17 However, it should be noted that the supplementary carbon budgets, beyond 2037, have not been formally adopted by the Government or ratified by parliament. Therefore, they can only be used as an indicative measure to contextualise the Proposed Development's progress towards the national net-zero trajectory.

Table 17-4 UK Carbon Budgets and Indicative Carbon Budgets Based Upon the CCC's Balanced Net-Zero Pathway

Carbon budget period	UK Carbon Budget ($MtCO_2e$)	Indicative Carbon Budgets based upon the	Indicative CCC's Electricity Supply Carbon	Indicative CCC's Construction Carbon Budgets

[386] IPCC (2021) Assessment Report 6. Available at: https://www.ipcc.ch/assessment-report/ar6/
[387] Committee on Climate Change, 2021; *UK Carbon Budgets*. Available at: https://www.gov.uk/guidance/carbon-budgets

		CCC's balanced net-zero pathway ($MtCO_2e$)	Budgets based upon the CCC's balanced net–zero pathway for Electricity Supply ($MtCO_2e$)	based upon the CCC's balanced net–zero pathway for Construction ($MtCO_2e$)
4th (2023-2027)	1,950		189	254
5th (2028-2032)	1,725		93	183
6th (2033-2037)	965		36	95
7th (2038-2042)		526	23	34
8th (2043-2047)		195	12	17
9th (2048-2050)		17	3	9

Table 17-5: Welsh Carbon Budgets

Carbon Budget Period	Welsh Carbon Budget ($MtCO_2e$)
2021-2025	163
2026-2030	127
2031-2035	83
2036-2040	48
2041-2045	27
2046-2050	14

Significance of effects

17.5.18 The IEMA Guidance (Climate Change) states that there are currently no agreed methods to evaluate quantified levels of GHG significance, that the application of the standard EIA significance criteria is not considered to be appropriate for climate change mitigation assessments, and that professional judgement is required to contextualise a project's GHG emission impacts.

17.5.19 The IEMA Guidance (Climate Change) states that mitigation should be considered from the outset and throughout the Proposed Development's lifetime while also helping deliver proportionate EIAs. Once the magnitude of emissions is determined, mitigation measures should be proposed. Any mitigation measures committed to within a proposed development must be included within the assessment.

17.5.20 The IEMA Guidance (Climate Change) describes five distinct levels of significance, which are not solely based on whether a project emits GHG emissions alone but on how the project makes a relative contribution towards achieving a science-based 1.5 °C aligned transition towards net zero. The different significance levels are plotted against the UK's net zero compatible trajectory, as presented in **Table 17-6** to evaluate the scheme's likely significance.

17.5.21 The effect of a project can shift from significant to non-significant by incorporating mitigation measures that substantially improve on business-as-usual and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero.

Table 17-6 Definition of Levels of Significance

Significance Level	Effects	Description	Example in the IEMA Guidance (Climate Change)
Significant	Major adverse	A project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the UK's net zero trajectory or accepted aligned practice or area-based transition targets. It is down to the practitioner to differentiate between the 'level' of significant adverse effects e.g. 'moderate' or 'major' adverse effects.	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
	Moderate adverse		The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
Not significant	Minor adverse	A project that is compatible with the budgeted, science based 1.5 °C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035, thereby potentially avoiding significant effects.	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
	Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is

Significance Level	Effects	Description	Example in the IEMA Guidance (Climate Change)
		trajectory and has minimal residual emissions. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.	achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
Significant	Beneficial	A project that causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

Approach and Assessment Criteria – CCRA

17.5.22 The CCRA will qualitatively assess the Proposed Development's resilience to climate change. This will be completed in liaison with the project design team and the other EIA technical disciplines by considering the UKCP18 projections for the geographical location and timeframe of the Proposed Development (including during the construction, operation and decommissioning phases).

17.5.23 The ES will provide a statement describing how the Proposed Development will be designed to improve its resilience to future climatic conditions.

Sensitivity

17.5.24 The receptor for the CCRA is the Proposed Development itself, including workers, infrastructure, and visitors.

Magnitude of Impact

17.5.25 The CCRA considers the impact of climate on the Proposed Development by identifying likely changes to the climate and potential climate hazards over the life of the Proposed Development. The assessment has considered climate projections over a 30-year period following the completion of the Train 1 construction phase (or combined single phase).

17.5.26 Climate parameters to be considered in the CCRA during construction, operation and decommissioning phases of the Proposed Development include the following:

- extreme weather events;
- flood risk;
- SLR;
- wild fires;
- droughts;
- temperature change; and

- precipitation change.

17.5.27 The CCRA will qualitatively assess the Proposed Development's resilience to climate change by considering the UKCP18 projections for the geographical location and timeframe of the Proposed Development (including the construction, operation and decommissioning).

17.5.28 The CCRA will identify potential climate change impacts on the Proposed Development and associated receptors, and consider their potential consequence and likelihood of occurrence, taking account of the measures incorporated into the design of the Proposed Development.

17.5.29 For each of the three phases of the Proposed Development, potential climate change impacts will be identified using relevant projections from UKCP18. The CCRA will consider their potential consequence to receptors and likelihood of occurrence, taking account of the measures incorporated into the design of the Proposed Development.

17.5.30 The following key terms and definitions relating to the CCRA will be used:

- climate hazard – a weather or climate related event, which has potential to do harm to environmental or community receptors or assets, for example, increased winter precipitation;
- climate change impact – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose; and
- consequence – any effect on the receptor or asset resulting from the climate hazard having an impact.

17.5.31 The criteria which will be used to determine the likelihood of a climate change hazard occurring are detailed in **Table 17-7.** The event is defined as the climate event (such as heatwave), while the hazard is defined as an impact on the Proposed Development caused by the climate event (such as overheating of electrical equipment).

Table 17-7 Description of Likelihood for Climate Change Hazard

Level of likelihood of climate hazard	Qualitative description	Quantitative Description
Frequent	Likely that the event will occur many times (reoccurs frequently). Evidence/indications strongly suggests a transition from business as usual will occur with the impact anticipated to be substantial.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is 100%.
Occasional	Likely that the event will occur sometimes (reoccurs infrequently). Evidence/indications suggests a transition from business as usual will occur with major impacts.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is 50 - 99%.
Remote	Unlikely that the event will occur, but possible (has occurred rarely).	Climate projection ensemble mean for the percentage of years throughout the

Level of likelihood of climate hazard	Qualitative description	Quantitative Description
	Evidence/indications hint a transition from business as usual will occur although the impacts are anticipated to be minimal.	considered time period with an event occurrence is 25 - 50%.
Improbable	Very unlikely that the event will occur (not known to have occurred). There is little indication or evidence of a transition occurring.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is < 25%.
Extremely improbable	Almost inconceivable that the event or transition will occur.	Climate projection ensemble mean for the percentage of years throughout the selected time period has an event occurrence of 0%.

17.5.32 Engagement will be undertaken with relevant environmental disciplines and the engineering design team to discuss the CCRA and identify mitigation measures for incorporation into the design of the Proposed Development.

17.5.33 The CCRA is qualitative and provides commentary on how the Proposed Development will be resilient to climate change within the context of current and predicted future climate conditions.

17.5.34 The likelihood of a climate impact occurring is based on the likelihood of the hazard occurring combined with the vulnerability of the Proposed Development, using professional judgement and in discussion with the design team. Embedded mitigation measures will also be considered, and a likelihood rating will be assigned as described in **Table 17-8**.

17.5.35 After identifying climate hazards, the likelihood and consequences will be assessed according to **Table 17-8** and **Table 17-9** , respectively. The categories and descriptions provided in these tables are based on the IEMA climate change resilience and adaptation guidance.

Table 17-8 Categories for the Likelihood of the Climate-Related Impact Occurring

Likelihood category	Description
High	Likelihood of climate hazard occurring is high and impact is always/ almost always going to occur.
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/ almost always.
Low	Likelihood of climate hazard occurring is high, but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/ almost always.
Negligible	All other eventualities - highly unlikely but theoretically possible.

Table 17-9 Description of Consequences

Consequence of impact	Description
High	Significant disruption to construction and operations, unable to deliver services, resulting in high financial losses.
Moderate	Disruption to construction and operations and ability to deliver services, resulting in some financial losses/ cost implications.
Low	Minor disruption to construction and operations does not significantly impact the ability to deliver services.
Negligible	Negligible disruption to construction and operations, does not impact ability to deliver services.

Significance of Effects

17.5.36 The CCRA will assess the significance of effects by evaluating the combination of the likelihood of the climate-related impact occurring and the consequence, as per the risk assessment matrix in **Table 17-10**. The assessment will take into account confirmed design and mitigation measures (referred to as embedded mitigation).

Table 17-10 Significance of Effect Matrix (where 'S' is Significant and 'NS' is Not Significant)

		Likelihood of climate-related impact occurring			
		Negligible	Low	Moderate	High
Measure of consequence	Negligible	NS	NS	NS	NS
	Low	NS	NS	NS	S
	Moderate	NS	NS	S	S
	High	NS	S	S	S

Approach and Assessment Criteria – ICCI

17.5.37 The study area for the ICCI assessment will be determined by the EIA topic assessments, as described in other technical sections of this report.

17.5.38 The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets) are affected by the Proposed Development in combination with future climatic conditions as sourced from UKCP18 projections. The impacts are considered for the construction, operation and decommissioning phases of the Proposed Development.

Sensitivity

17.5.39 The receptors for the ICCI assessment will be those the Proposed Development will impact. These impacts will be assessed in liaison with the technical specialists responsible for preparing the applicable technical chapters.

Magnitude of impact

17.5.40 The likelihood of a climate impact occurring is based on likelihood of the hazard occurring combined with the vulnerability of the Proposed

Development, using the professional judgement of the technical specialists responsible for preparing the applicable technical chapters and in discussion with the design team. Embedded mitigation measures will also be considered, and a likelihood rating will be assigned as described in **Table 17-7** and **Table 17-8**.

17.5.41 The likelihood of a climate risk occurring and the likelihood of an impact to a receptor will then be combined to determine the likelihood of an ICCI occurring. This is illustrated in **Table 17-11**.

Table 17-11 Level of likelihood of the climate-related impact occurring.

Level of likelihood of climate impact occurring	Definition of likelihood
High	Likelihood of climate hazard occurring is high and impact is always/almost always going to occur.
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/ almost always.
Low	Likelihood of climate hazard occurring is high but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/ almost always.
Negligible	All other eventualities – highly unlikely but theoretically possible.

17.5.42 Once the likelihood of an ICCI has been identified, the assessment then considers how this will affect the significance of the identified effects.

17.5.43 The ICCI consequence criteria are defined in **Table 17-12** and are based on the change to the significance of the impact already identified by the environmental discipline. To assess the consequence of an ICCI, each discipline has assigned a level of consequence to an impact based on the criteria description and their discipline assessment methodology.

Table 17-12 Consequence Criteria for In-Combination Climate Change Impact Assessment

Consequence	Consequence criteria
High	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/receptor, as defined by the topic, to increase from negligible, low, or moderate to major.
Moderate	The climate change parameter in-combination with the effect of the Proposed Development causes the effect defined by the topic to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of effect defined by the topic, to increase from negligible to low.
Negligible	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

Significance of Effects

17.5.44 The significance of potential effects will be determined using the matrix in **Table 17-10**. Where an effect has been identified as moderate or high will be classed as a significant ICCI effect.

17.6 Embedded Mitigation

Lifecycle GHG Impact Assessment

17.6.1 The scope for mitigating climate change effects on and from the Proposed Development will be determined following completion of the lifecycle GHG impact assessment. Mitigation will focus on measures to reduce GHG emissions from the construction, operation and decommissioning of the Proposed Development to align with the UK Government's target to achieve net-zero emissions by 2050 and remain so thereafter. Any emissions beyond this date must therefore be balanced by removals.

17.6.2 Embedded mitigation may include measures to reduce embodied carbon through the use of lower-carbon materials, or streamlined construction techniques. It is important to note that the Proposed Development is itself a low-carbon project which will contribute to the ongoing decarbonisation of the UK power sector through the use of carbon capture and storage (CCS) technology .

17.6.3 Gas-fired generation fitted with CCS will significantly reduce lifetime operational emissions relative to existing, unabated power stations. The use of the Proposed Development is likely to displace generation from unabated installations, thereby directly contributing to grid decarbonisation in support of the UK's legally-binding net zero targets.

CCRA and ICCI

17.6.4 The scope for mitigating measures for the CCRA and ICCI will be informed by the design team and other relevant ES technical chapters. These will focus on measures to increase the resilience of the Proposed Development and receptors in the surrounding environment to climate change impacts and will be informed by the design team and other relevant ES technical assessments. For example, this may include designing surface water drainage systems to make sure flows up to the 1 in 100-year return period can be contained and managed within the Proposed Development.

17.7 Potential Effects

Lifecycle GHG Impact Assessment

17.7.1 The impact of the Proposed Development is defined as an increase of GHG emissions to the global atmosphere. For example, increasing GHG emissions contribute to global climate change. Disruption to the global climate already has diverse and wide-ranging impacts on the environment, society, economy, and natural resources. Known effects of climate change include: increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound,

global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.

CCRA

17.7.2 The Proposed Development may be vulnerable to impacts in relation to extreme weather events, sea level rise, temperature, precipitation, and wind.

ICCI

17.7.3 Receptors identified by other disciplines may be vulnerable to in-combination impacts in relation to extreme weather events, sea level rise, temperature, precipitation, and wind.

17.8 Additional Mitigation

17.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

17.9 Summary of Potential Likely Significant Effects

17.9.1 Potential likely significant effects proposed to be scoped in and out of the assessment are summarised in **Table 17-13**.

Table 17-13 Summary of the potential likely significant effects to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Construction	GHG Assessment • Demolition – On-site deconstruction activity, i.e. demolition and dismantling of existing structures and buildings. – Transportation and disposal of dismantled equipment, earthworks, and disposal of waste. – Land clearance. • Product Manufacture – Raw material extraction and manufacturing of products/ materials associated with the Proposed Development. – Transport of products/ materials to the Proposed Development associated with the Proposed Development. • Construction – On-site construction activity associated with the modification of the Proposed Development. – Transport of construction workers associated with the modification of the Proposed Development. – Transportation and disposal of earthworks/ waste associated with the Proposed Development. CCR Assessment • Extreme weather events • Flood risk • SLR • Wild fires • Droughts • Temperature change • Precipitation ICCI Assessment • Extreme weather events • SLR • Temperature • Precipitation • Wind	No	N/A
Operation	GHG Assessment • Operation of the Proposed Development under continuous monitoring and surveillance.	No	N/A

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
	• Transportation and disposal of waste from the Proposed Development. • Proposed Development Building and grounds maintenance. • Emissions displacement from the Proposed Development. • Landscaping CCR Assessment • Extreme weather events • Flood risk • SLR • Wild fires • Droughts • Temperature change • Precipitation ICCI Assessment • Extreme weather events • SLR • Temperature • Precipitation • Wind		
Decommissioning	GHG Assessment • On-site deconstruction activity, i.e. demolition of existing plant and equipment, existing waste management facilities etc. • Transportation, waste processing and disposal of dismantled equipment, earthworks and disposal of waste. • Land clearance. • Qualitative GHG Assessment will be undertaken for the decommissioning phase. CCR Assessment • Extreme weather events • Flood risk • SLR • Wild fires	No	N/A

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
	• Droughts • Temperature change • Precipitation ICCI Assessment • Extreme weather events • SLR • Temperature • Precipitation • Wind		

18. Human Health

18.1 Introduction

18.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on human health. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

18.1.2 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report.

18.1.3 The following EIA technical topics will inform the health assessment: **Chapter 6: Air Quality; Chapter 7: Noise and Vibration; Chapter 8: Traffic and Transportation; Chapter 11: Water Environment and Flood Risk; Chapter 16: Socio-Economics, Recreation and Tourism; Chapter 17: Climate Change; and Chapter 20: Major Accidents and Disasters**.

18.2 Legislation, Policy and Guidance

18.2.1 This chapter will consider the Proposed Development in the context of established national and local policy standards and best practice benchmarks. This will include human health policy alignment with the Proposed Development. A brief overview of key legislation, policy, and guidance considerations is provided below. A more detailed summary will be provided in the PEIR and the ES.

National Policies and Legislation

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- Public Health (Wales) Act 2017[388];
- PPW;
- The NP; and
- Well-being of Future Generations Wales Act 2015.

Local Policies

- FCC LDP (Objectives 1 and 8).

[388] Public Health (Wales) Act 2017 anaw. 2. London: HMSO.

Guidance

- IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (IEMA Health Guidance)[389]; and
- Wales Health Impact Assessment Support Unit Guidance[390].

18.3 Assumptions, Limitations and Uncertainties

18.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

18.3.2 The human health assessment will be partly based on professional judgement and consider both the adverse and beneficial impacts that the Proposed Development may have on surrounding receptors. It provides an indication of human health effects on people and the local community.

18.3.3 It should be noted that it is not always practicable to determine the catchment area for community facilities. Residents of an area may utilise facilities located within different districts or regions without regard for statutory boundaries.

18.3.4 The assessment of the likely significance of effects will be carried out against a benchmark of current human health baseline conditions in the vicinity of the Site, as far as is practicable within the limitations of such a dataset. Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

18.3.5 When preparing the baseline conditions section, not all data may be available at the granular ward level. If this is the case, a suitable alternative will be selected as the next available geography. Instances of this will be made clear in the text.

18.3.6 It is assumed that the construction works would be undertaken in accordance with a CEMP which will set out the key measures to be employed during the Proposed Development construction phase.

18.4 Baseline Conditions

18.4.1 Public health profile and demographic data produced by Public Health Wales (PHW), ONS and other sources has been reviewed for the purposes of this EIA Scoping Report. A human health profile will be developed for the PEIR and ES which focuses on key indicators at ward level, including a comparison with district and national averages.

Study Area

18.4.2 The Site intersects five electoral wards in the local authority of Flintshire. These form the study area for the baseline:

- Connah’s Quay: Central;

[389] IEMA, 2022; *Guide to: Effective Scoping of Human Health in Environmental Impact Assessment*. March: IEMA.
[390] PHW, 2020; *Health Impact Assessment: A Practical Guide* [online]. Available at: https://phwwhocc.co.uk/wp-content/uploads/2020/07/Health-Impact-Assessment-A-Practical-guide.pdf

- Connah's Quay: Golftyn;
- Flint: Oakenholt;
- Flint: Castle; and
- Flint: Coleshill and Trelawny.

18.4.3 For each of these areas, indicators deemed relevant to the likely human health effects of the Proposed Development have been identified; data relating to these indicators and the comparative geographies is set out in **Table 18-1**.

18.4.4 Where data is not available at ward level, a suitable alternative will be chosen to form the study area such as a collection of LSOAs or the local authority. It will be made clear when this is the case.

Sources of Information

18.4.5 An initial review of the human health baseline has been undertaken using a number of recognised data sources including:

- Census 2021;
- Welsh Index of Multiple Deprivation;
- PHW Observatory[391]; and
- General Medical Services Quality Assurance and Improvement Framework[392].

18.4.6 The list above is intended to provide an outline of sources and it should be noted that additional datasets may be used in the preparation of the ES.

Baseline

Table 18-1 Health baseline

Health Indicator	Study Area	Flintshire	Wales
Population aged under 16 (%)	18.7	17.7	17.6
Population aged 65+ (%)	18.4	21.4	21.3
General health – good or very good (%)	79.7	80.8	78.6
General health – bad or very bad (%)	6.3	5.7	6.9
Unemployment rate (aged 16+) (%)	3.3	2.8	3.1
Life expectancy at birth (males)	-	79.5	78.5
Life expectancy at birth (females)	-	82.7	82.3
Disabled under the Equality Act (%)	19.5	19.1	21.6
Prevalence of obesity (aged 16+) (%)	-	10.7	10.1
Patients with chronic mental health illness (%)	-	0.8	1.0
Prevalence of chronic obstructive pulmonary disease (%)	-	2.4	2.4

[391] PHW, 2022; *Public Health Wales Observatory* [online]. Available at: https://phw.nhs.wales/services-and-teams/observatory/data-and-analysis/ (Accessed 19/12/2023).
[392] Welsh Government, 2020; *General Medical Services Quality Assurance and Improvement Framework* [online]. Available at: https://www.gov.wales/quality-assurance-and-improvement-framework-qaif-general-medical-services-contract-2019-2020 (Accessed 19/12/2023).

Source: Census 2021; General Medical Services Quality Assurance and Improvement Framework

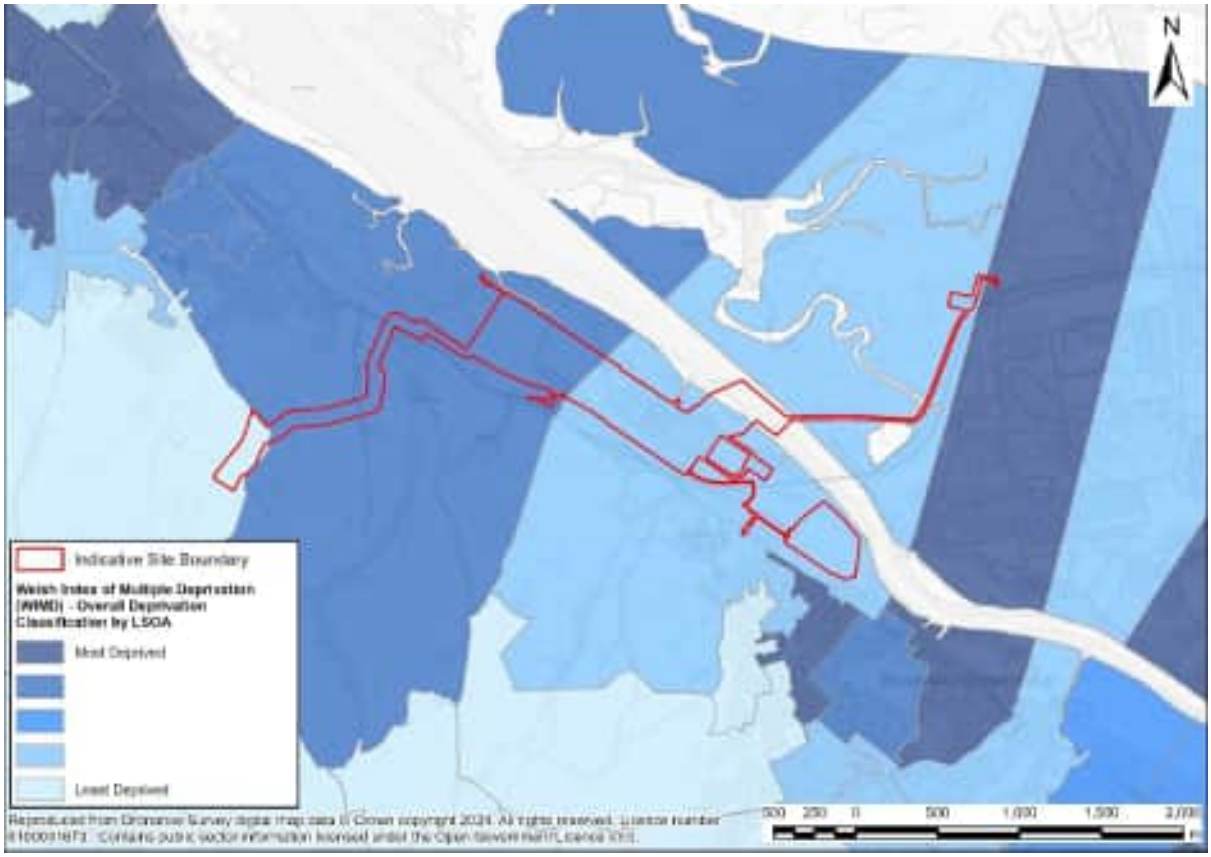
18.4.7 **Table 18-1** illustrates that the population of the study area is generally younger than in Flintshire or Wales as a whole. There is a lower proportion of people aged 65 or over in the study area (18.4%) than in Flintshire (21.4%) and Wales (21.3%).

18.4.8 In regard to health, the general health of the population of the study area is in line with Flintshire and Wales, with 79.7% of residents in the study area in good or very good health, compared to 80.8% in Flintshire and 78.6% in Wales. Further, the proportion of people disabled under the Equality Act in the study area is 19.5%, similar to Flintshire (19.1%), but lower than across the country (21.6%).

18.4.9 Unemployment is slightly higher in the study area, with 3.3% of residents unemployed compared to 2.8% in Flintshire and 3.1% across Wales.

18.4.10 Data regarding deprivation is unavailable at ward level but is available at LSOA level. **Plate 18-1** illustrates the level of overall deprivation around the Site. It shows that a lot of the LSOAs covering the Site Boundary are in the 'least deprived' category, whilst there are pockets of more severe deprivation in the towns of Flint and Connah's Quay.

Plate 18-1 Map of deprivation around the Site



Source: Welsh Index of Multiple Deprivation 2019

Future Baseline

18.4.11 The Human Health chapter of the ES will explain what the environmental change, in terms of human health, would likely be in the future if the Proposed Development were not to go ahead. It is expected that the future baseline would be representative of the conditions and trends set out in the

current baseline section of this chapter. In the absence of the Proposed Development, the impact on human health is not anticipated to be materially different.

18.5 Impact Assessment Methodology

18.5.1 This chapter will identify the communities that would be subject to impacts associated with the Proposed Development and will identify the potential effects on the health and well-being of those communities in Flintshire and the wider area, as a consequence of the Proposed Development.

18.5.2 The assessment will follow the generic EIA methodology set out in **Chapter 4: Project Alternatives and EIA Methodology** by using relevant significance criteria to assess potential effects. This is in line with IEMA Health Guidance, published in 2022, and also Wales Health Impact Assessment Support Unit Guidance, published in 2020.

18.5.3 It will consider the likely direct, indirect and cumulative impacts associated with human health during construction and operation phases. It will largely draw on other chapters of the ES as listed in Paragraph 18.1.3.

18.6 Embedded Mitigation

18.6.1 Mitigation and measures for the construction and operational phases (some of which may have already been considered through the development of the proposals) will be considered and key indicators for monitoring human health impacts will be established wherever applicable.

18.7 Potential Effects

18.7.1 IEMA Health Guidance suggests that if a change in a wider determinant of health is likely, it should be scoped into the human health assessment. The assessment must present the ‘likely significant’ human health effects of the Proposed Development. Potential human health effects are anticipated relating to the following receptors and determinants:

- health and social care services;
- employment and income;
- education and training;
- transport modes, access, and connections;
- air quality;
- noise and vibration;
- open space, leisure, and play;
- climate change mitigation and adaptation;
- water quality or availability; and
- radiation and exposure to electromagnetic fields.

18.7.2 A consideration of source-pathway-receptor linkages assists in identifying where there is potential for health effects to be both likely and significant.

18.7.3 **Table 18-2** sets out a summary of the health determinants scoped into the assessment and the source, pathway, and receptor links relevant to each and at what project phase.

Table 18-2 Health determinants scoped into human health assessment – Source-Pathway-Receptor links

Source	Pathway	Receptor	Project Phase
Potential changes to access to health and social care services e.g. from additional workforce required for Proposed Development.	Potential adverse impacts on access to health services including use of GP services.	Human receptors living within local communities and using services within the study area.	Construction; operation; and decommissioning.
Potential temporary or permanent increase in employment, education and training opportunities, directly related to the Proposed Development, or within the wider supply chain.	Potential beneficial economic impacts arising from employment, education and training opportunities for those working on the Proposed Development, or within the wider supply chain, which could impact human health.	Human receptors who could potentially benefit from employment, education and training opportunities, directly related to the Proposed Development, or within the wider supply chain.	Construction; operation; and decommissioning.
Potential temporary or permanent increases in traffic on the local road network.	Potential adverse impacts on access to health services including use of GP services and other social infrastructure such as schools.	Human receptors who are users of the local road network.	Construction; operation; and decommissioning.
Potential temporary or permanent changes in local air quality including increased dust and particulate matter emissions arising from the construction, operation and decommissioning of the Proposed Development.	Potential adverse human health impacts arising from increased exposure to dust and particulate matter emissions arising from the Proposed Development.	Human receptors likely to be at risk of possible direct and indirect air quality impacts from the Proposed Development.	Construction; operation; and decommissioning.
Potential temporary or permanent changes in noise levels arising from the Proposed Development.	Potential adverse human health impacts arising from increased exposure to noise arising from the Proposed Development.	Human receptors likely to be at risk of possible direct and indirect noise impacts from the Proposed Development.	Construction; operation; and decommissioning.
Potential changes in access to open spaces, PRoW and opportunities for recreation and physical activity, e.g. due to temporary or	Potential adverse impacts on open spaces, PRoW, recreational facilities and opportunities for physical activity and active travel which	Human receptors who are users of local open spaces, PRoW and the local road network for cycling or walking.	Construction; operation; and decommissioning.

Source	Pathway	Receptor	Project Phase
permanent closures / diversions, increases in road traffic or amenity impacts on routes.	could impact human health.		
Potential temporary or permanent changes to Greenhouse Gas (GHG) emissions and potential temporary or permanent changes to climate change resilience (CCR) including extreme weather events, flood risk, sea level rise (SLR), temperature change and rainfall change.	Potential human health impacts arising from increased or reduced exposure to GHG emissions arising from the Proposed Development as well as potential adverse human health impacts arising from increased on Site risk of extreme weather events, flood risk, SLR, temperature change or rainfall change.	Human receptors likely to be exposed to increased or reduced GHG emissions arising from the Proposed Development.	Construction; operation; and decommissioning.
Potential temporary or permanent changes in exposure levels to radiation.	Potential adverse human health impacts arising from impacts from exposure to electromagnetic fields.	Human receptors likely to be exposed to radiation in the form of electromagnetic fields.	Operation.

18.8 Additional Mitigation

18.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

18.9 Summary of Potential Likely Significant Effects

18.9.1 Potential likely significant effects proposed to be scoped in and out of the assessment are summarised below in **Table 18-3**.

Table 18-3 Summary of the potential likely significant effects to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Human Health			
Construction	Access to healthcare and other social infrastructure services, both in terms of potential increases in road traffic and increase in workforce population. Employment and income and education and training opportunities, including provision of economic opportunities and resources that protect and promote good health. Human health impacts associated with air quality, noise and vibration, flood risk, and surface water impacts. Access to open space, PRoW, recreational facilities and opportunities for physical activity and active travel. Climate change – greenhouse gas emissions.		
Operation	Access to healthcare and other social infrastructure services, both in terms of potential increases in road traffic and increase in workforce population. Employment and income and education and training opportunities, including provision of economic opportunities and resources that protect and promote good health. Human health impacts associated with air quality, noise and vibration, flood risk, and surface water impacts.		

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
	Access to open space, PRoW, recreational facilities and opportunities for physical activity and active travel. Climate change – greenhouse gas emissions. Radiation – potential exposure to EMFs.		
Decommissioning	Access to healthcare and other social infrastructure services, both in terms of potential increases in road traffic and increase in workforce population. Employment and income and education and training opportunities, including provision of economic opportunities and resources that protect and promote good health. Human health impacts associated with air quality, noise and vibration, flood risk, and surface water impacts. Access to open space, PRoW, recreational facilities and opportunities for physical activity and active travel. Climate change – greenhouse gas emissions.		

19. Major Accidents and Disasters

19.1 Introduction

19.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on Major Accidents and Disasters (MA&Ds). This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

19.1.2 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report, as well as **Chapter 6: Air Quality**, **Chapter 9: Terrestrial and Aquatic Ecology**, **Chapter 11: Water Environment and Flood Risk**, and **Chapter 17: Climate Change**.

19.2 Legislation, Policy and Guidance

19.2.1 A summary of the relevant national, and local legislation and planning policy to major accidents and disasters is provided in this section.

Legislation

- The Environmental Impact Assessment Directive 2014/52/EU[393] (Paragraph 15);
- The EIA Regulations (Regulation 5(4); Schedule 4(8));
- The Control of Major Accident Hazards (COMAH) Regulations 2015[394];
- The Pipelines Safety Regulations (PSR) 1996[395];
- The Planning (Hazardous Substances) Regulations 2015[396];
- The EPR 2016;
- Health and Safety at Work etc. Act 1974[397];
- The Workplace (Health, Safety and Welfare) Regulations 1992[398];
- The Gas Safety (Management) Regulations 1996[399];
- The Lifting Operations and Lifting Equipment Regulations 1998[400];
- The Management of Health and Safety at Work Regulations 1999[401];
- The Dangerous Substances and Explosive Atmospheres Regulations 2002[402];

[393] Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment Text with EEA relevance. *Official Journal* L124:1. Luxembourg: Publications Office of the European Union.
[394] *The Control of Major Accident Hazards (COMAH) Regulations 2015* (SI 2015/483). London: HMSO.
[395] *The Pipelines Safety Regulations 1996* (SI 1996/825) (as amended SI 2023/284). London: HMSO.
[396] *The Planning (Hazardous Substances) Regulations 2015* (SI 2015/627). London: HMSO.
[397] *Health and Safety at Work etc. Act 1974* (c. 37). London: HMSO.
[398] *The Workplace (Health, Safety and Welfare) Regulations 1992* (SI 1992/3004). London: HMSO.
[399] *The Gas Safety (Management) Regulations 1996* (SI 1996/551). London: HMSO.
[400] *The Lifting Operations and Lifting Equipment Regulations 1998* (SI 1998/2307). London: HMSO.
[401] *The Management of Health and Safety at Work Regulations 1999* (SI 1999/3242). London: HMSO.
[402] *The Dangerous Substances and Explosive Atmospheres Regulations 2002* (SI 2002/2776). London: HMSO.

- The Control of Substances Hazardous to Health Regulations 2002 (COSHH)[403];
- Civil Contingencies Act 2004[404];
- The Regulatory Reform (Fire Safety) Order 2005[405];
- The Building Regulations 2010[406]; and
- CDM Regulations 2015.

National Planning Policy

- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4);
- The NPS for Electricity Networks Infrastructure (EN-5);
- Planning Practice Guidance[407];
- The NP; and
- FCC LDP.

Guidance

19.2.2 There is no specific guidance available which sets out the approach for undertaking a MA&Ds assessment within an EIA. However, the scope of the assessment has been developed with reference to "Major Accidents and Disasters in EIA: A Primer" (IEMA, 2020)[408] which lays out emerging best practice.

19.2.3 The Health and Safety Executive (HSE) has published a number of applicable guidance notes on its website, including:

- Emergency Planning for Major Accidents (HSG 191): COMAH Regulations 2015[409];
- Further Guidance on Emergency Plans for Major Accident Hazard Pipelines[410];
- Reducing Risks, Protecting People: HSE's Decision Making Process[411]; and

[403] *The Control of Substances Hazardous to Health Regulations 2002* (SI 2002/2677). London: HMSO.
[404] *Civil Contingencies Act 2004* (c. 36). London: HMSO.
[405] *The Regulatory Reform (Fire Safety) Order 2005* (SI 2005/1541). London: HMSO.
[406] *The Building Regulations 2010* (SI 2010/2214). London: HMSO.
[407] Department for Levelling Up, Housing and Communities (DLUHC) and Ministry of Housing, Communities & Local Government (MHCLG), 2023; *Planning Practice Guidance* [online]. Available at: https://www.gov.uk/government/collections/planning-practice-guidance
[408] IEMA, 2020; *Major Accidents and Disasters in EIA: A Primer*. [online]. Available at: https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer.
[409] HSE, 2015; *Emergency Planning for Major Accidents (HSG 191): COMAH Regulations 2015*. Sudbury: HSE Books.
[410] HSE, 1996; *Further guidance on emergency plans for major accident hazard pipelines* [online]. Available at: https://www.hse.gov.uk/pipelines/assets/docs/emergencyplanpipe.pdf (Accessed 04/12/2023).
[411] HSE. 2001; *Reducing Risk, Protecting People: HSE's Decision Making Process* [online]. Available at: https://www.hse.gov.uk/enforce/assets/docs/r2p2.pdf (Accessed 04/12/2023).

- HSE Major Hazard Regulatory Model: Safety Management in Major Hazard Sectors[412]

19.2.4 Other guidance that is of relevance to the assessment of MA&Ds includes:

- Chemicals and Downstream Oil Industries Forum (CDOIF) Guidelines, Environmental Risk Tolerability for COMAH Establishments[413];
- Emergency Preparedness Guidance on Part 1 of the Civil Contingencies Act 2004[414] (Chapter 4) (HM Government, 2006);
- DEFRA's The Green Leaves III Guidelines for Environmental Risk Assessment[415];
- ISO 31000:2018 Risk Management – Guidelines[416]; and
- Guidance on the Interpretation of Major Accidents to the Environment for the purposes of COMAH Regulations[417].

19.3 Assumptions, Limitations and Uncertainties

19.3.1 This scoping report is based on construction, commissioning, preliminary design, process and decommissioning information that is currently available and early appraisal of potential hazards. These will be refined and reappraised as the Proposed Development's design progresses and will be reported in the ES.

19.3.2 For the purposes of the assessment the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

19.4 Baseline Conditions

Study Area

19.4.1 The study area for assessment of MA&Ds is not defined within regulatory guidance or standardised methodology. However, it is likely that a study area of 5 km from the Site will be utilised, based on the use of professional judgement and previous assessments of similar, comparable projects.

19.4.2 For the purpose of EIA Scoping, a high-level review of installations in close proximity to the Site has been undertaken within 5 km of the Site Boundary. The study area may be refined during later stages of assessment, as information on the location and risks associated with particular hazards is developed.

19.4.3 It is assumed that no works will be required within the Repurposed CO_2 Connection Corridor and the Existing Natural Gas Connection Corridor.

[412] HSE, n.d.; *Major Hazard Regulatory Model: Safety Management in Major Hazard Sectors* [online]. Available at:, https://www.hse.gov.uk/regulating-major-hazards/assets/docs/major-hazards-regulatory-model.pdf
[413] CDOIF, 2017; *Guideline – Environmental Risk Tolerability for COMAH Establishments v2.0* [online]. Available at: https://www.sepa.org.uk/media/219154/cdoif_guideline__environmental_risk_assessment_v2.pdf (Accessed 04/12/2023).
[414] Cabinet Office, 2012*; Emergency Preparedness Guidance on Part 1 of the Civil Contingencies Act 2004* [online]. Available at: https://www.gov.uk/government/publications/emergency-preparedness (Accessed 04/12/2023)
[415] DEFRA, 2011; *Guidelines for Environmental Risk Assessment and Management Green Leaves III* [online]. Available at: https://assets.publishing.service.gov.uk/media/5a79d20540f0b66d161ae5f9/pb13670-green-leaves-iii-1111071.pdf
[416] ISO, 2018; *ISO 31000:2018 Risk Management – Guidelines*. Geneva: ISO.
[417] Department for the Environment, Transport and Regions, 1999; *Guidance on the Interpretation of Major Accident to the Environment for the Purpose of the COMAH Regulations* [online]. Available at: https://www.sepa.org.uk/media/219153/detr-guidance-1999.pdf [Accessed 19/12/2023].

While an appropriate baseline for these aspects of the Proposed Development has been identified, these aspects are not considered further within this assessment

Sources of Information

19.4.4 The following data sources have been utilised to inform the scoping baseline:

- Overview of Natural and Man-made Disaster Risks the European Union may face[418];
- National Risk Register 2023[419];
- BGS GeoIndex Onshore;
- COMAH 2015 Public Information Search[420]; and
- Google aerial and street view maps covering the study area.

19.4.5 As the Proposed Development's design progresses, additional datasets may be included where relevant to assist the assessment of MA&Ds.

Environmental Baseline of Relevance to MA&Ds

19.4.6 Connah's Quay has a temperate oceanic climate typical of the UK. Historic climate data for the area is presented in **Chapter 17: Climate Change**.

19.4.7 The region has relatively frequent small earthquakes totalling 218 quakes since 2015, the maximum magnitude of which was 3.9. None of these were classified by the BGS as significant.

19.4.8 As described in **Chapter 11: Water Environment and Flood Risk**, the Site is predominantly within Flood Zone 3 due to tidal flooding (areas with more than 0.5% (1 in 200) chance of flooding from the sea in a given year).

Infrastructure and Industrial Sites

19.4.9 The Site is close to the Deeside Industrial Park, a large industrial estate containing multiple plants in operation and storage facilities, two of which are COMAH Installations:

- Great Bear Distribution Warehouse, an Upper tier COMAH installation which stores large amounts of pressurised flammable gases. This is located approximately 2.2 km east of the Main Site and 1.4 km east of the existing natural gas connection corridor.
- Valspar Paint Shop, a Lower tier COMAH installation operated by Sherwin-Williams. This was designated as it is a storage and distribution centre for basic organic chemicals. This development is located approximately 4.8 km east of the Main Site and 3.1 km east of the existing natural gas connection corridor.

[418] European Commission, 2021; *Overview of natural and man-made disaster risks the European Union may face*. Luxembourg: Publications Office of the European Union.
[419] Cabinet Office, 2023; *National Risk Register of Civil Emergencies* [online]. Available at: https://www.gov.uk/government/publications/national-risk-register-2023 (Accessed 04/12/2023).
[420] HSE, 2015; *COMAH 2015 Public Information Search* [online]. Available at: https://notifications.hse.gov.uk/COMAH2015/search.aspx (Accessed 04/12/2023).

19.4.10 Another industrial site within the study area is the Shotton Steelworks operated by Tata Steel Limited, located just outside the Deeside Industrial Park approximately 1.5 km east of the Main Site and 0.7 km east of the Indicative Enhancement Area. This site is a Lower Tier COMAH installation due to its metal processing operations and associated materials.

19.4.11 Furthermore, the existing Connah's Quay Power Station, operated by the Applicant, although not a COMAH installation, is present within the Main Site. Additionally, there are major hazard pipelines operated by the Applicant and by Liverpool Bay CCS Limited within the study area.

19.4.12 There is a National Grid substation directly adjacent to the Main Site, containing infrastructure associated with the transmission and distribution of energy including high voltage (HV) 400 kV overhead power lines.

19.4.13 Transport infrastructure in the area includes docks, roads and railway lines. Connah's Quay Dock is located approximately 1.9 km to the south-east of the Site. Primary roads in the area include the A548, A550 and the A494. Shotton and Hawarden Bridge train stations and their associated rail lines also fall within the study area. There are no major airports within the study area and the Site does not fall within any Aerodrome Safeguarding Areas. The nearest airport is Hawarden Airport, a small one runway airport located 6.9 km south-east of the Site.

19.4.14 The nearest residential areas to the Main Site include areas within the district of Flintshire, such as Connah's Quay, Flint, Shotton and Deeside. The estimated total population of Flintshire was 155,000 (ONS, 2021)[421].

Sensitive Receptors of Relevance to MA&Ds

19.4.15 The following sensitive receptors which could be vulnerable to a MA&Ds have been identified:

- private residences (and their inhabitants) within the local area;
- local economic receptors including businesses and employees;
- community receptors, including Public Rights of Way, community land, and community buildings;
- the historic and cultural environment including archaeological heritage and built heritage;
- designated ecological sites, fully described in **Chapter 9: Terrestrial and Aquatic Ecology**, including:
  - the Dee Estuary/Aber Afon Dyfrdwy Ramsar site, Special Area of Conservation (SAC), Special Protection Area (SPA), and Site of Special Scientific Interest (SSSI), adjacent to the Site;
  - The River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC / Afon Dyfrdwy / River Dee SSSI, adjacent to the Site;
  - Deeside and Buckley Newt Sites SAC / Connah's Quay Ponds and Woodland SSSI, Maes y Grug SSSI and Buckley Claypits and Commons SSSI, approximately 1.5 km south of the Site;

[421] ONS, 2021; *How life has changed in Flintshire: Census 2021* [online]. Available at: https://www.ons.gov.uk/visualisations/censusareachanges/W06000005/ (Accessed 04/12/2023).

  - Halkyn Mountain / Mynydd Helygain SAC / Comin Helygain a Glaswelltiroedd Treffynnon / Halkyn Common and Holywell Grasslands SSSI, approximately 3.6 km west of the Site;
  - Shotton Lagoons and Reedbeds SSSI, approximately 0.1 km south-west of the Site;
  - Mynydd Y Fflint / Flint Mountain SSSI, approximately 0.5 km west of the Site;
  - Inner Marsh Farm SSSI, approximately 1.3 km north of the Site; and
  - Other non-statutory sites and priority habitats.
- the water environment, including groundwater, the River Dee, and surrounding ponds / lagoons;
- infrastructure and built environment including transport infrastructure, industrial infrastructure, and energy infrastructure; and
- the interactions between the receptors above.

Summary of Current MA&Ds Risks

19.4.16 The Site is located within the proximity of several COMAH installations, each of which having the potential to form a domino effect. The risks which may lead to this domino effect include, but are not limited to: fire, explosion, release of (flammable, toxic, asphyxiant, corrosive, environmentally harmful etc.) substances to air, water, ground and groundwater.

19.4.17 Key natural hazards risks include the following, the risks of which could be exacerbated by climate change:

- ground instability;
- flooding;
- extreme meteorological events such as electrical storms, heavy rainfall, high winds, heatwave, drought, cold and snow; and
- wildfire.

19.5 Impact Assessment Methodology

19.5.1 The following process will be used to identify Risk Events, to be scoped in to detailed assessment in the ES:

- baseline information relevant to MA&Ds will be collated, including the potential for natural disasters and the presence of neighbouring industrial facilities;
- an assessment of the substances which will be present on site to identify those classified as hazardous in accordance with the Classification, Labelling and Packaging (CLP) of Chemicals Regulations 2015[422] as well as the arrangements for their transportation and storage;

[422] *The Classification, Labelling and Packaging of Chemicals (Amendments to Secondary Legislation) Regulations 2015* (SI 2015/21). London: HMSO.

- a review of the operations and activities carried out throughout the lifecycle of the Proposed Development, to determine the potential for Risk Events; and
- A long list of Risk Events for MA&Ds will be collated, considering the substances, process and baseline conditions that have been identified.

19.5.2 The identified Risk Events will then be subject to the assessment procedure described below.

Assessment Criteria

19.5.3 Following the principles of the IEMA primer on the assessment of MA&D in EIA, MA&D assessment criteria are based upon the risk assessment process, which considers the consequences and likelihood of a risk event occurring. Reference has been made to the guidance provided by the CDOIF Guideline, Environmental Risk Tolerability for COMAH Establishments and the guidance provided as part of the civil contingencies act to develop project-specific assessment criteria.

19.5.4 To establish assessment criteria for the MA&D assessment, the CCA risk assessment framework was compared against the requirements of the EIA Regulations to identify if the CCA risk assessment framework on its own would be sufficient to meet the requirements of the EIA Regulations.

19.5.5 It was considered that the receptors and assessment criteria provided within the CCA risk assessment framework were not sufficient to ensure compliance with the requirements of the EIA Regulations on their own, as the framework considered all environmental receptors in one category and did not provide a mechanism for taking into account mitigation.

19.5.6 As such, assessment criteria have been developed in accordance with the CDOIF Guidelines on Environment Risk Tolerability for COMAH Establishments, which is a common approach adopted in MA&D assessments in recent applications for NSIPs. However, for clarity, throughout the assessment criteria adopted for the ES, reference is also made to the criteria provided within the CCA risk assessment framework to allow for consistency with future emergency planning at a local level.

19.5.7 In line with CDOIF Guidelines, the assessment characterises hazards or threats against the following categories in order to assign a tolerability and a risk classification to each hazard or threat:

- severity of harm;
- duration;
- consequence; and
- probability.

19.5.8 The severity of harm and consequence of a risk event are determined on the basis of a reasonably foreseeable worst-case scenario of the event in the absence of mitigation. The probability of the risk event occurring is determined whilst considering proposed embedded or ‘primary’ mitigation measures. This is because mitigation would reduce the likelihood of the maximum severity of harm, duration, consequence and frequency of a risk event occurring.

Severity of Harm

19.5.9 The criteria used in the MA&D assessment for determining the severity of harm of a hazard or threat, which are based on both CDOIF Guidelines and the criteria within the CCA risk assessment framework, are shown in **Table 19-1**. Any risk events where the severity of harm is identified as ‘no serious damage’ for the reasonably foreseeable worst-case consequence are scoped out of this MA&D assessment.

Table 19-1 Assessment of severity of harm

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		**Insignificant**	**No serious damage**	**Minor or moderate**	**Severe**	**Significant**	**Major**	**Catastrophic**	**Catastrophic**
CCA cat	**CDOIF cat**	**CCA ref.**	**CDOIF ref.**	**CCA ref.**	**CDOIF ref.**	**CCA ref.**	**CDOIF ref.**	**CCA ref.**	**CDOIF ref.**
Health	People (including workers, members of the public)	Insignificant number of injuries or impact on health	Small number of minor injuries	Small number of people affected, no fatalities, and small number of minor injuries with first aid treatment Or Moderate number of fatalities with some casualties requiring hospitalisation and medical treatment and activation of MAJAX[423], the automated intelligent alert notification	Substantial number of people requiring medical attention.	Significant number of people in affected area impacted with multiple fatalities, multiple serious or extensive injuries. Significant hospitalisation and activation of MAJAX procedures across a number of hospitals.	Multiple life changing injuries, potential loss of life in low numbers.	Very large numbers of people in affected area(s) impacted with significant numbers of fatalities, large number of people requiring hospitalisation with serious injuries with longer-term effects.	Potential loss of life in high numbers and substantial number of life changing injuries.

[423] MAJAX – refers to major accident

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
				system, procedures in one or more hospitals.					
Social	N/A	Insignificant number of persons displaced and personal support required. Insignificant disruption to community services, including transport services and infrastructure.		Minor damage to properties. Minor displacement of a small number of people for <24 hours and minor personal support required. Minor localised disruption to community services or infrastructure <24 hours Or Damage that is confined to a specific location, or to		Significant damage that requires support for local responders with external resources. 100 to 500 people in danger and displaced for longer than one week. Local responders require external resources to deliver personal support or Significant impact on, and possible		Extensive damage to properties and built-up environment in affected area requiring major demolition. General and widespread displacement of more than 500 people for prolonged duration and extensive personal support required. Serious damage to infrastructure causing significant disruption to,	

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
				a number of locations, but requires additional resources. Localised displacement of >100 people for 1-3 days, or Localised disruption to infrastructure and community services.		breakdown of, delivery of some local community services.		or loss of, key services for prolonged period. Community unable to function without significant support.	
Economic	N/A	Insignificant impact on local economy		Negligible impact on local economy and cost easily absorbed Or Limited impact on local economy with some short-term loss of		Significant impact on local economy with medium-term loss of production. Significant extra clean-up and recovery costs.		Serious impact on local and regional economy with some long-term, potentially permanent, loss of production with some structural change.	

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
				production, with possible additional clean-up costs.				Extensive clean-up and recovery costs.	
Environ-ment	Designated Land/ Water Sites (Internationally important) (e.g. SAC, SPA, Ramsar)	Insignificant impact on environment.	<0.5 ha or <5%	Minor impact on environment with no lasting effects Or	>0.5 ha or 10-25% of site area, associated linear feature or population.	Significant impact on environment with medium-to long-term effects	25-50% of site area, associated linear feature or population.	Serious long-term impact on environment and/or permanent damage	>50% of site area, associated linear feature or population
	Designated Land/ Water Sites (Nationally important) (e.g. NNR, SSSI, MNR)		<0.5 ha or <10%	Limited impact on environment with short-term or long-term effects	>0.5 ha or 10-50% of site area, associated linear feature or population.		50% of site area, associated linear feature or population		N/A
	Other Designated Land (e.g. AoNB, National Park)		<10 ha or <10%		10-100 ha or 10-50% of land.		>100 ha or >50% of land.		N/A
	Scarce habitat		<2 ha or <10%		2-20 ha or 10-50% of habitat.		>20 ha or >50% of habitat.		N/A
	Widespread habitat – non-designated land		<10 ha		Contamination of 10-100 ha of land, preventing		100-1000 ha		>1000 ha

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
					growing of crops, grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively, contamination of 10 ha or more of vacant land.		(applied as per text under 'Severe').		(applied as per text under 'Severe').
	Widespread habitat – non-designated water		N/A		Contamination of aquatic habitat which prevents fishing or aquaculture, or renders is inaccessible to the public.		N/A		N/A
	Groundwater – source of drinking water		Interruption of drinking water supply <1000 person-hours or for England & Wales only <1 ha Source Protection Zone (SPZ).		Interruption of drinking water supplied from a ground or surface source (where persons affected ×		>1 × 10^7 person-hours interruption of drinking water (a town of ~100,000 people losing supply for		>1 × 10^9 person-hours interruption of drinking (~1 million people losing supply for 1 month)

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
					duration in hours [at least 2] >1,000) or for England & Wales only 1-10 ha of SPZ where drinking water standards are breached.		month) or for England & Wales only 10 100 ha SPZ drinking water standards breached.		or for England & Wales only >100 ha SPZ drinking water standards breached.
	Groundwater – non drinking water source		<1 ha		1-100 ha of aquifer where water quality standards are breached (or hazardous substance is discernible).		100-10,000 ha		>10,000 ha
	Groundwater in unproductive strata		Where the groundwater is a pathway for another receptor assess against relevant criteria for the receptor.		Where the groundwater is a pathway for another receptor assess against relevant criteria for the receptor.		Where the groundwater is a pathway for another receptor assess against relevant criteria for the receptor.		Where the groundwater is a pathway for another receptor assess against relevant criteria for the receptor.
	Soil or sediment		Contamination not leading to environmental		Contamination of 10-100 ha of land etc. as per		Contamination of 100-1,000 ha of land, as per		Contamination of >1,000 ha of land, as per

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
			damage (as per Environmental Liability Directive), or not significantly affecting overlying water quality.		Widespread Habitat; Contamination sufficient to be deemed environmental damage (Environmental Liability Directive).		Widespread Habitat; Contamination rendering the soil hazardous to humans (e.g. skin contact) or the living environment but remediation available.		Widespread Habitat; Contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment and remediation difficult or impossible.
	Built environment (limited to Grade 1 / Cat A listed buildings, scheduled ancient monuments, conservation areas etc)		Damage below a level at which designation of importance would be withdrawn.		Damage sufficient for designation of importance to be withdrawn.		Feature of built environment subject to designation of importance entirely destroyed.		N/A
	Particular species		Loss of <1% of animal or <5% of plant ground cover in a habitat.		Loss of 1-10% of animal or 5-50% of plant ground cover.		Loss of 10-90% of animal or 50-90% of plant ground cover.		Total loss (>90%) of animal or plant ground cover.

Assessment Terminology		No serious damage		Severe		Major		Catastrophic	
Receptors		Insignificant	No serious damage	Minor or moderate	Severe	Significant	Major	Catastrophic	Catastrophic
CCA cat	CDOIF cat	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.	CCA ref.	CDOIF ref.
	Marine		<2 ha littoral or sublittoral zone, <100 ha of open sea benthic community, <100 dead sea birds (<500 gulls), <5 dead/significantly impaired sea mammals.		2-20 ha littoral or sublittoral zone, 100-1,000 ha of open sea benthic community, 100-1000 dead sea birds (500-5,000 gulls), 5-50 dead/significantly impaired sea mammals.		20-200 ha littoral or sub-littoral zone, 100-10,000 ha of open sea benthic community, 1,000-10,000 dead sea birds (5,000-50,000 gulls), 50-500 dead/significantly impaired sea mammals.		>200 ha littoral or sublittoral zone, >10,000 ha of open sea benthic community, >10,000 dead sea birds (>50,000 gulls), >500 dead/ significantly impaired sea mammals.
	Fresh and estuarine water habitats		Impact below that of Severe		Water Framework Directive (WFD) Chemical or ecological status lowered by one class for 2-10 km of watercourse or 2-20 ha or 10-50% area of estuaries or ponds. Plus interruption of drinking water supplies.		WFD Chemical or ecological status lowered by one class for 10-200 km of watercourse or 20- 200 ha or 50-90% area of estuaries and ponds. Plus interruption of drinking water supplies.		WFD Chemical or ecological status lowered by one class for >200 km of watercourse or >200 ha or >90% area of estuaries and ponds. Plus interruption of drinking water supplies.

Duration of Harm

19.5.10 The criteria for the assessment of the duration of harm is also based on CDOIF and HSE Guidelines and are shown in **Table 19-2**.

Table 19-2 Assessment of duration of harm

Receptor	Short Term	Medium Term	Long Term	Very Long Term or Permanent
Population	Injury or impairment lasting up to 1 week	Injury or impairment lasting up to 4 months but no permanent consequences	Some permanent restriction to leisure and work activities	Death/fatality
Groundwater or surface water drinking water source (public or private)	N/A	N/A	Harm affecting drinking water source or SPZ <6 years	Harm affecting drinking water source or SPZ >6 years
Groundwater (except drinking water sources): WFD Hazardous / Non-Hazardous Substances	WFD hazardous substances <3 months	WFD hazardous substances >3 months	WFD hazardous substances >6yrs	WFD hazardous substances >20 years
	WFD non-hazardous substances <1yr	WFD non-hazardous substances >1y	WFD non-hazardous substances >10 years	WFD non-hazardous substances >20 Years
Surface water (except drinking water sources – see above)	<1year	>1 year	>10 years	>20 years
Land	<3 years or <2 growing seasons for agricultural land	>3 years or >20 growing seasons for agricultural land	>20 years	>50 years
Built environment	Can be repaired in <3 years, such that its designation can be reinstated	Can be repaired in >3 years, such that its designation can be reinstated	Feature destroyed, cannot be rebuilt, all features except world heritage site	Feature destroyed, cannot be rebuilt, world heritage site
Marine	<1 year	>1 year	>10 years	>20 years

Level of Consequence

19.5.11 The level of consequence matrix for the MA&D assessment has been defined using CDOIF Guidelines and is shown in **Table 19-3**. Level of consequence considers the severity of harm and the duration of the harm to separate hazards and threats into five categories (‘Not a MA&D’ and categories A to D). ‘Not a MA&D’ represents the lowest level of consequence and category ‘D’ the highest.

Table 19-3 Assigning a level of consequence

		Duration			
		Short term	Medium term	Long term	Very long term or permanent
Severity of harm	Catastrophic	Not a MA&D	C	D	D
	Major	Not a MA&D	B	C	D
	Severe	Not a MA&D	A	B	C
	No Serious Damage	Not a MA&D	Not a MA&D	Not a MA&D	Not a MA&D

Probability

19.5.12 The probability of a risk event occurring has been assessed in accordance with the definitions presented in **Table 19-4**, which are derived from CDOIF and CCA guidelines.

Table 19-4: Assessment of Probability

Probability	Extremely Improbable	Extremely Remote	Remote	Rare	Unlikely	Likely	
CDOIF Quantitative Definition	Less than 1 in 10,000,000 years	1 in 1,000,000 years to 1 in 10,000,000 years	1 in 100,000 years to 1 in 1,000,000	1 in 10,000 to 1 in 100,000 years	1 in 100 years to 1 in 10,000 years	Greater than 1 in 100 years	
CCA Quantitative Definition	>1 in 20,000 chance over 5 years			>1 in 2,000 chance over 5 years	>1 in 200 chance over 5 years	>1 in 20 chance over 5 years	>1 in 2 chance over 5 years
CCA Qualitative Descriptor	Negligible			Rare	Unlikely	Possible	Probable

Classification of Risk

19.5.13 Tolerability of a risk is identified by considering the level of consequence of a risk event and probability of the worst-case environmental consequence occurring. The criteria used to classify the risk of each risk event are presented in **Table 19-5**.

Table 19-5: Assessment of Tolerability

	Probability					
Consequence	**Extremely Improbable**	**Extremely Remote**	**Remote**	**Rare**	**Unlikely**	**Likely**
D	Tolerable	Tolerable if ALARP[424]	Intolerable	Intolerable	Intolerable	Intolerable
C	Tolerable	Tolerable	Tolerable if ALARP	Intolerable	Intolerable	Intolerable
B	Tolerable	Tolerable	Tolerable	Tolerable if ALARP	Intolerable	Intolerable
A	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable if ALARP	Intolerable
Not a MA&D	Not within the scope of MA&D assessment					

19.6 Embedded Mitigation

19.6.1 Good practice mitigation measures will be embedded within the design to minimise the risks of a MA&D scenario occurring, and are required by legislation including COMAH. Good practice construction and operation procedures will also be required.

19.7 Potential Effects

19.7.1 Preliminary identification of the long list of potential MA&Ds scenarios has been undertaken and is summarised in **Table 19-6**. Where there is a lack of information at this time regarding any MA&Ds, this has been scoped in as a precautionary measure. The long list of credible MA&Ds is subject to change as more information becomes available during the course of the assessment.

19.7.2 The key substances which would be present at the Proposed Development and have the potential to generate impacts include the following:

- natural gas will be the power plants main fuel source and will be present within the Existing Natural Gas Connection and the CCGT plant. It is a hydrocarbon mixture comprising mostly of methane, which is classified as extremely flammable. If released, there is the potential for a fire and/ or explosion;
- CO_2 is produced as part of the power generation process, it is then captured and exported offsite via the Existing/Proposed CO_2 Connection. If a significant quantity of CO_2 is released in high concentrations, this gas can present a risk of asphyxiation;

[424] '"ALARP" is short for "as low as reasonably practicable". Reasonably practicable involves weighing a risk against the trouble, time and money needed to control it. The ALARP principle is used to describe an expected level of residual risk involved with a system or set of operations, in case it is not possible to eliminate the risk. What this means, is that the applicant, overseen by regulatory authorities, is responsible for exercising good practice and judgement to ensure that necessary measures have been taken in order to reduce the levels of risk, such that the residual risk levels are 'as low as reasonably practicable'. Risks categorised 'tolerable if ALARP' would generally require further approval of the details for proposed mitigation by a regulatory body.

- aqueous NH_3 would likely be used to reduce emissions from combustion equipment. This substance is classified as harmful to the aquatic environment;
- a proprietary amine solution would be used for carbon capture. This type of substance is generally classified as harmful, as it would cause irritation if inhaled or in contact with the skin or eyes;
- substances would be used to treat water and effluent generated by process operations such as biocides. These may be classified as harmful to the aquatic environment;
- diesel, which would be used within the Site for fuel during construction and for backup generators during operation, is classified as flammable and harmful to the aquatic environment;
- liquid concrete could be present in significant quantities during construction and would be harmful if a release occurred in which material entered a watercourse due to its pH; and
- compressed Gases such as Acetylene and/or Nitrogen are materials used for welding during construction and maintenance. These materials are kept in compressed gas cylinders, a sudden release of which can lead to explosions or asphyxiation if released in an enclosed area.

19.7.3 The technology used for CCGT power stations using natural gas and post-combustion carbon capture is well established and the equipment to be used will be designed and constructed to precise industry standards. This industry is subject to rigorous safety and environmental regulations, with operators of such facilities required to demonstrate integrity via the submission of Safety Case documentation. In addition, the operational site will be regulated through other consents and licenses such as Hazardous Substances Consent, COMAH Licensing, and an Environmental Permit and these regulatory regimes will demand appropriate systems, controls and management procedures to safeguard workers and off-site receptors. There is a very low risk of failure to occur which could result in a loss of containment of hazardous substances.

19.7.4 There is potential for an impact to be generated as a result of commissioning activities, i.e. during wet testing of the equipment and plant before operations commence in full. Such procedures would involve the same hazardous substances as operational activities, but with a higher risk profile due to the one off nature of the some of the commissioning activities (i.e. charging the storage vessels, testing of the critical safety equipment (e.g. shutoff valves) etc.). Commissioning procedures, including details of any mitigation measures should be detailed in a commissioning report which is typically required to support both the environmental permit and the COMAH Safety report and will require approval from HSE.

Table 19-6: Summary of the potential likely significant effects to be considered in the ES ("Long List" of Risk Events)

Topic	Rationale for Consideration
Construction Hazards	
Accident Impact / Structural Collapse	Construction hazards can include events which have the potential for harm, including fatal injuries to workers. These include the collapse of buildings, structures and excavations, vehicle accidents, contact with HV transmission cables (overhead and buried), contact with underground utility services and UXO.
Road Traffic Accident	Collisions/ accidents involving road tankers delivering hazardous materials to the Site could result in direct harm to people, or a loss of containment of materials which could result in harm to people or environmental receptors.
Release of concrete into the Dee Estuary	Concrete is an alkaline substance which cause harm to people when it makes contact with skin, it can also damage aquatic ecosystems by raising the pH. The containment systems would likely be sufficient to prevent release of concrete to the environment.
Release of pressurised gas	Accidental damage to compressed gas cylinders could lead to the release of explosive / asphyxiant gas resulting in direct harm to people. The number of pressurised gas cylinders stored within the Site for construction works is expected to be relatively low. Industry standard procedures will be applied for their storage and equipment will be certified to prevent accidental release and ignition.
Commissioning Hazards	
Fire	The accidental release of flammable substances such as natural gas could result in a fire if immediately ignited or exposed to leftover substances from the construction phase. This could result in harm to people within the Site and potentially outside the Site.
Explosion	The accidental release of flammable substances such as natural gas could result in an explosion if the gas accumulates prior to ignition or if it is exposed to leftover substances from the construction phase. This could result in significant harm to people within the Site and potentially outside the Site.
Asphyxiant Gas Release	A significant release of CO_2 could result in harm to people within the Site and potentially outside the Site.
Release of Environmentally Harmful Liquid	A release of hazardous liquids such as aqueous ammonia, amine solution or diesel could reach highly sensitive environmental receptors such as the Dee Estuary.
Operational Hazards	
Fire	The accidental release of flammable substances such as natural gas could result in a fire if immediately ignited. This could result in harm to people within the Site and potentially outside the Site.
Explosion	The accidental release of flammable substances such as natural gas could result in an explosion if the gas accumulates prior to ignition. This could result in significant harm to people within the Site and potentially outside the Site.

Topic	Rationale for Consideration
Asphyxiant Gas Release	A significant release of CO_2 could result in harm to people within the Site and potentially outside the Site.
Release of Environmentally Harmful Liquid	A release of hazardous liquids such as aqueous ammonia, amine solution or diesel could reach highly sensitive environmental receptors such as the Dee Estuary
Domino Event	A major incident occurring at Shotton Steelworks or the Deeside Industrial Park could escalate and cause an impact at the Main Site. Conversely, a major incident at the Main Site could have an impact on neighbouring facilities.
Road Traffic Accident	The Main Site will send and receive the bulk of its materials via pipeline; however, some auxiliary materials would need to be transported in a Road Tanker.
Firewater Effluent	Firewater containment systems will be installed at site as required for COMAH installations. The Environmental Permit for the operation of the Site will require containment systems to be suitably robust to minimise release of effluent to the environment.
Other Industrial Hazards	
Electrical Failure	During operation, electrical failure or power loss can be caused by supply issues or disruption to infrastructure. Process equipment and instrumentation would be designed to fail to a safe condition and the Proposed Development will include installation of back-up power generation and uninterruptable power supplies (UPS).
System / Utilities Failure	Disruption to process systems and utilities such as effluent disposal may have an impact on process operations. This would be considered within the design of the Proposed Development and the appropriate back-ups and safety systems installed.
Meteorological Hazards	
High windspeed / storms	There is a low probability of a hurricane force event occurring at the Proposed Development; however, major storms and gales could result in damage to infrastructure. These issues will be incorporated within the engineering design of buildings and structures and the appropriate engineering standards used so operations are unlikely to be interrupted.
High temperatures / Heat wave	In the event of a prolonged period of hot weather there is the potential for an impact to temperature sensitive equipment such as process cooling systems and electrical switchgear, and risk of overpressure of natural gas/CO_2 in pipelines and tanks. These issues will be incorporated within the engineering design of buildings and structures and the appropriate engineering standards used so operations are unlikely to be interrupted.
Low temperatures / Heavy snow	The climate in the north of Wales is typically mild. In the event of extreme, prolonged low temperatures and snowfall, there is the potential for snow loading on buildings and freezing liquids in pipework. These issues will be incorporated within the engineering design of buildings and structures and the appropriate engineering standards used so operations are unlikely to be interrupted.

Topic	Rationale for Consideration
Drought	The Proposed Development is not expected to be vulnerable to drought conditions, as there is a low risk of interruptions to the supplies of water in this location.
Electrical storms	Lightning could result in damage to the Proposed Development as a result of a direct strike to buildings or structures. There is also the potential for lightning to act as a source of ignition if damage occurred during the storm causing a loss of containment of flammable gases. Design engineering standards to be incorporated by the Proposed Development for the provision of lighting protection systems on buildings and structures are well established.
Hydrological Hazards	
Coastal flooding	The Main Site is located along the River Dee close to the Irish Sea coast, with the majority of the site being located in Flood Zone 3 (greater than 0.5% AEP sea flooding). The risk will be considered within the Flood Risk Assessment and summarised within the Water Environment and Flood Risk chapter.
Fluvial flooding	The Main Site is on the River Dee with parts in Flood Zone 3 (greater than 1% AEP river flooding). The risk will be considered within the Flood Risk Assessment and summarised within **Chapter 11: Water Environment and Flood Risk**.
Pluvial flooding	Parts of the Proposed Development Site have a moderate risk (greater than 1% flood risk from surface water). The risk will be considered within the Flood Risk Assessment and summarised within **Chapter 11: Water Environment and Flood Risk**.
Groundwater flooding	A Flood Consequences Assessment was carried out in 2021 which concluded that parts of the Site are at moderate risk of groundwater flooding. The risk will be considered within the Flood Risk Assessment and summarised within **Chapter 11: Water Environment and Flood Risk**. This is considered a credible MA&D scenario, therefore scoped in for further assessment.
Geophysical Hazards	
Earthquake	There is a moderate record of seismic activity observed at the Site; however, none of these records were considered to be significant. Appropriate seismic resilience will be incorporated within the engineering design of buildings and structures and the appropriate engineering standards used so operations are unlikely to be interrupted.
Ground Stability	Groundworks carried out prior to construction will provide a stable site at the Main Site and within Proposed CO_2 Connection Corridor (where required for new pipelines) prior to construction. The Flintshire area has a low risk of landslides, ground collapse, ground compression, or sinkholes associated with site geology.
Volcanic Eruptions	The UK is in close proximity to a number of volcanoes in Europe, in particular Bárðarbunga and Eyjafjallajökull in Iceland, which erupt frequently and could potentially blow ash and gas towards the Site.
Other Natural Hazards	

Topic	Rationale for Consideration
Poor Air Quality	Pollution episodes are known to occur in the UK but the Proposed Development is not expected to be particularly vulnerable to this hazard. Emissions from combustion equipment will be assessed within **Chapter 6: Air Quality** and will be controlled and regulated in accordance with an environmental permit.
Wildfires	Severe wildfires are infrequent in the UK and the Proposed Development is not located in an environment particularly vulnerable to wildfire, being primarily urban/industrial.
Societal Hazards	
Outbreak of Disease	An outbreak of disease including animal, health-notifiable disease, emerging infectious disease and pandemic influenza could affect and spread within the workforce.
Malicious Attacks	Malicious attacks could include intentional violence to people, arson or other methods of destruction of property, cyber-attacks, or chemical, biological, or nuclear attacks by terrorists or other actors. These events have been known to occur at infrastructure sites in the UK. However, these risks are mitigated at the national level as a matter of national security.

19.8 Additional Mitigation

19.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided.

19.9 Summary of Potential Likely Significant Effects

19.9.1 A summary of the preliminary long list of potential MA&Ds events described in **Table 19-6** that could arise from the Proposed Development and whether these are scoped into or out of future assessment are laid out in **Table 19-7**.

Table 19-7 Summary of the potential likely significant effects proposed to be considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Construction	Construction Hazards	Other Industrial Hazards Meteorological Hazards Hydrological Hazards Geophysical Hazards Other Natural Hazards Societal Hazards	Due to the shorter duration of the construction phase and smaller chemical inventory compared to the operational phase the likelihood of a MA&D of these types occurring is much lower.
Commissioning	Commissioning Hazards	Other Industrial Hazards Meteorological Hazards Hydrological Hazards Geophysical Hazards Other Natural Hazards Societal Hazards	Due to the short duration of the commissioning phase compared to the operational phase the likelihood of a MA&D of these types occurring is much lower.
Operation	Operational Hazards Other Industrial Hazards Meteorological Hazards Hydrological Hazards Geophysical Hazards Other Natural Hazards Societal Hazards		
Decommissioning		Decommissioning Hazards	It is likely that sufficient information will not be available to inform an assessment of decommissioning hazards. Hazards will be controlled via a DEMP produced and agreed with NRW as part of the Environmental Permit surrender.

20. Materials and Waste

20.1 Introduction

20.1.1 This chapter sets out the proposed scope and methodology for the assessment of effects of the Proposed Development on materials and waste. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Proposed Development.

20.1.2 This chapter follows the methodology set out in the IEMA Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (IEMA Guidance (Materials and Waste))[425].

20.1.3 For the purpose of this Scoping Report, materials and waste comprise:

- the consumption of materials (key construction materials only including concrete, aggregate, asphalt, and steel); and
- the generation and management of waste.

20.1.4 Materials are defined in the IEMA Guidance (Materials and Waste) as “physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt, and steel”.

20.1.5 Other material assets considered include built assets such as landfill void capacity, waste management facilities and allocated/safeguarded mineral and waste sites.

20.1.6 Waste is defined as per the European Waste Framework Directive[426] (E Waste FD) as “any substance or object which the holder discards or intends or is required to discard".

20.1.7 This chapter should be read in conjunction with the description of the Proposed Development presented in **Chapter 3: The Proposed Development** of this scoping report.

20.2 Legislation, Policy and Guidance

20.2.1 This section provides an overview of the relevant legislation, planning policy and technical guidance relevant to the materials and waste assessment.

Legislation

Retained EU Directives

- E Waste FD.

[425] IEMA, 2020; *Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach*. March: IEMA.
[426] European Union, 2008; Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (2008/98/EC). *Official Journal* L312:3. Luxembourg: The Publications Office of the European Union.

National Legislation

- Environmental Protection Act 1990 (as amended);
- The Hazardous Waste (England and Wales) Regulations 2005 (as amended);
- The Waste (England and Wales) Regulations 2011[427] as amended;
- The EPR 2016; and
- Environment Act 2021.

Devolved Legislation

- Environment (Wales) Act 2016; and
- Waste (Wales) Measure 2010[428].

National Planning Policy

- Beyond Recycling: A strategy to Make the Circular Economy in Wales a Reality[429];
- PPW;
- Towards Zero Waste One Wales: One Planet – The Overarching Waste Strategy Document for Wales [430];
- Towards Zero Waste One Wales: One Planet – Collections, Infrastructure and Markets Sector Plan (CIMP)[431];
- Towards Zero Waste One Wales: One Planet – The Waste Prevention Programme for Wales Local Planning Policy[432];
- Strategy for Hazardous Waste Management in England[433] (Principle 2 - Infrastructure Provision);
- The Overarching NPS for Energy (EN-1);
- The NPS for Natural Gas Electricity Generating Infrastructure (EN-2);
- The NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4); and
- The NPS for Electricity Networks Infrastructure (EN-5).

Local Planning Policy

20.2.2 The following local planning documents are relevant to the Proposed Development:

[427] *The Waste (England and Wales) Regulations 2011* (SI 2011/1889). London: HMSO.
[428] *Waste (Wales) Measure 2010* (nawm 8). London: HMSO.
[429] Welsh Government, 2021; *Beyond Recycling: A Strategy to Make the Circular Economy in Wales a Reality* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2021-03/beyond-recycling-strategy-document.pdf (Accessed 14/12/2023).
[430] Welsh Government, 2010; *Towards Zero Waste One Wales: One Planet – The Overarching Waste Strategy Document for Wales* [online]. Available at: https://www.gov.wales/towards-zero-waste-our-waste-strategy (Accessed 14/12/2023).
[431] Welsh Government, 2010; Towards Zero Waste One Wales: One Planet – Collections, Infrastructure and Markets Sector Plan (CIMP). London: HMSO.
[432] Welsh Government, 2013; *Towards Zero Waste One Wales: One Planet – The Waste Prevention Programme for Wales* [online]. Available at: https://www.gov.wales/sites/default/files/publications/2019-05/the-waste-prevention-programme-for-wales.pdf (Accessed 14/12/2023).
[433] DEFRA, 2010; *The Strategy for Hazardous Waste Management in England*. London: HMSO.

- FCC LDP and Proposal Maps[434]; and
- FCC Waste Management Strategy (FWMS) 2009-2025[435].

Guidance

20.2.3 The following guidance documents are relevant to the materials and waste assessment:

- IEMA Guidance (Materials and Waste);
- Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (DoWCoP), v2 (2011)[436]; and
- Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering[437].

20.3 Assumptions, Limitations and Uncertainties

20.3.1 For the purposes of the assessment, the construction phase includes enabling and demolition works required to facilitate the Proposed Development.

20.3.2 This chapter is based on information available at the time of writing.

20.3.3 Future availability of construction materials is not available; therefore, Wales, Great Britain (GB) and United Kingdom (UK) data has been used to establish a quantitative baseline of the consumption of key construction materials, which is used as a proxy for availability.

20.3.4 There is no publicly available information regarding any potential changes to landfill capacity by the time of the Proposed Development's construction and operation. Therefore, landfill capacity is assumed to remain the same as the current baseline.

20.4 Baseline Conditions

Study Areas

20.4.1 The study areas for the assessment of impacts related to materials and waste are defined in line with the IEMA Guidance (Materials and Waste).

20.4.2 Study areas are defined for the following:

- construction and operational waste generation;
- use of construction and operational materials (key construction materials only);
- non-hazardous, inert and hazardous construction waste management;
- non-hazardous, inert and hazardous operational waste management;

[434] FCC, 2023; *Flintshire Local Development Plan 2015-2030 [– Proposal Maps]* [online]. Available at: https://flintshire.gov.uk/en/Resident/Planning/Flintshire-Local-Development-Plan.aspx (Accessed 14/12/2023).
[435] FCC, 2009; *Flintshire County Council Waste Management Strategy 2009-2025* [online]. Available at: https://www.flintshire.gov.uk/en/PDFFiles/Bins--Recycling/Flintshire-Waste-Management-Strategy.pdf (Accessed 14/12/2023).
[436] CL:AIRE, 2011; *Definition of Waste: Development Industry Code of Practice*. London: CL:AIRE.
[437] WRAP, undated; *Designing Out Waste: A Design Team Guide for Civil Engineering*. Banbury: WRAP.

- availability of key construction materials;
- impact on allocated/safeguarded mineral (e.g. quarries, wharves) and waste sites; and
- presence of Mineral Safeguarding Areas (MSAs). Impacts on MSAs are not assessed in the materials and waste assessment in accordance with the IEMA Guidance (Materials and Waste). MSAs are included for context in the baseline, since MSAs are a planning consideration and further consultation and assessment in accordance with Mineral Planning Authority policies may be required at a later stage. MSAs are *"designated by minerals planning authorities which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development"*[438].

Proposed Development Study Area

20.4.3 The Proposed Development study area for construction and operational waste generation and use of construction and operation materials (key construction materials only) comprises the Site. The study area is deemed to include the footprint of the proposed works, together with any temporary land requirements during construction. This may include temporary offices, compounds, and storage areas.

20.4.4 The study area for the impacts on allocated/safeguard mineral and waste sites is defined by the Site Boundary. Impacts on allocated/safeguarded waste sites are not included in the IEMA Guidance (Materials and Waste); however, they are included for completeness and a high-level assessment of impacts on such sites will be considered in the assessment if appropriate. There are currently no allocated/safeguarded mineral or waste sites within the Site Boundary.

Expansive Study Area

20.4.5 The expansive study area for non-hazardous and inert waste management comprises the whole of Wales, within which waste management infrastructure (specifically landfill capacity) is located. The expansive study area for non-hazardous and inert waste management is defined based on professional judgement and informed by consideration of the proximity principle (waste should generally be managed as near as practicable to its place of production) and value for money.

20.4.6 The expansive study area for availability of key construction materials (aggregates, asphalt, concrete and steel) is Wales, GB and the UK, dependent on baseline information availability.

20.4.7 The expansive study area for hazardous waste management is Wales and England. This study area is defined based on professional judgement and informed by consideration of the proximity principle and value for money. The proximity principle *"must be applied in Wales when decisions are taken on the siting of appropriate waste facilities"* as outlined in the Towards Zero Waste One Wales: One Planet – The Overarching Waste Strategy Document for Wales. The proximity principle for hazardous waste in England is outlined in Principle 2 - Infrastructure Provision in the Strategy for Hazardous Waste

[438] Department for Levelling Up, Housing and Communities, 2023; *National Planning Policy Framework.* London: Department for Levelling Up, Housing and Communities.

Management in England, "*We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self-sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and the proximity principle is met*". Planning for hazardous waste management is also undertaken at the UK level.

Sources of Information

20.4.8 Where not otherwise specified above, such as for local authority policies, the following data sources have been used to determine the baseline:

- NRW, Remaining Landfill Void in Wales[439];
- NRW, Find Details of Permitted Waste Sites[440];
- Environment Agency, EPR - Waste Sites[441];
- Environment Agency, 2022 Waste Data Interrogator – Version 2[442];
- Data Map Wales, Historic Landfill Sites[443];
- DEFRA, UK Statistics on Waste[444];
- WRAP, Waste Recovery Quick Wins. Improving Recovery Rates without Increasing Costs[445];
- UK Steel, Key Statistics Guide May 2023.[446]; and
- Minerals Products Association (MPA), Profile of the UK Mineral Products Industry (2023 Edition)[447].

Current Baseline

Availability of Key Construction Materials

20.4.9 The exact quantities of key construction materials required for the Proposed Development are currently unknown as the design is still in development.

20.4.10 Wales, GB, and UK data from UK Steel and MPA have been used to establish a quantitative national baseline of the availability for key

[439] NRW, 2018; *Remaining Landfill Void in Wales* [online]. Available at: https://naturalresourceswales.sharefile.eu/d-sb2191ade60e841a99cd356275d22f288 (Accessed 20/12/2023).
[440] NRW, 2023; *Find Details of Permitted Waste Sites* [online]. Available at: https://naturalresources.wales/evidence-and-data/maps/find-details-of-permitted-waste-sites/?lang=e n (Accessed 20/12/2023).
[441] Environment Agency, 2023; *Environmental Permitting Regulations - Waste Sites* [online]. Available at: https://environment.data.gov.uk/public-register/view/search-waste-operations (Accessed 20/12/2023).
[442] Environment Agency, 2023; *2022 Waste Data Interrogator – Version 2* [online]. Available at: https://www.data.gov.uk/dataset/aa53a313-f719-4e93-a98f-1b2572bd7189/2022-waste-data-interrogator (Accessed 20/21/2023).
[443] Welsh Government, 2017; *Data Map Wales., Historic Landfill Sites* [online]. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_Historic_Landfill_Sites (Accessed 20/12/2023).
[444] Defra, 2023; *UK Statistics on Waste* [online]. Available at: https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste (Accessed 20/12/2023).
[445] WRAP, 2007; *Waste Recovery Quick Wins. Improving Recovery Rates without Increasing Costs* [online]. Available at: https://www.environmental-expert.com/articles/waste-recovery-quick-wins-improving-recovery-rates-without-increasing-costs-21516 (Accessed 20/12/2023).
[446] UK Steel, 2023; *Key Statistics Guide May 2023* [online]. Available at: https://www.uksteel.org/versions/2/wizard/modules/fileManager/downloadDigitalFile.php?url=https%3A%2F%2Fstatic.s123-cdn-static-d.com%2Fuploads%2F8346772%2Fnormal_64d3974279292.pdf (Accessed 25/101/2024).
[447] MPA, 2023; *Profile of the UK Mineral Products Industry (2023 Edition)* [online]. Available at: https://www.mineralproducts.org/MPA/media/root/Publications/2023/Profile_of_the_UK_Mineral_Products_Industry_2023.pdf (Accessed 20/12/2023).

construction materials. **Table 20-1** summarises UK/GB sales in 2022 for aggregates, asphalt and concrete and UK requirement in 2023 for steel (the most recent years for which data is available), which are the key construction materials expected to be used during the construction of the Proposed Development. Wales data is presented in **Table 20-2**. It is assumed that the majority of key construction materials would be sourced locally, taking into account the proximity principle and value for money.

Table 20-1 UK/GB Requirement and Sales for Key Construction Materials

Material	Requirement/sales (million tonnes, year)	Baseline data year	Data description
Steel	17	2023	UK total consumption, UK Steel, Key Statistics Guide May 2023.
Aggregates of which:	279.8	2022	Minerals and mineral products sales in Great Britain, MPA, Profile of the UK Mineral Products Industry (2023 Edition).
Crushed rock	148.2		
Sand and gravel – land won	47.7		
Sand and gravel - marine	14.3		
Recycled and secondary	69.6		
Asphalt	28.3		
Ready-mixed concrete	52.7		
Concrete products	24.8		

Table 20-2 Construction Material Sales for Wales 2022

Construction material	Wales
Crushed rock (million tonnes)	12.7
Sand and gravel (million tonnes)	1.9
Ready-mixed concrete (million m^3)	0.5
Ready-mixed concrete (million tonnes converted from m^3 above)	1.2
Asphalt (million tonnes)	1.1

Source: MAKE UK

20.4.11 There is no publicly available information on any potential long-term changes to this national and regional demand by the time of construction of the Proposed Development. Construction material demand, such as ready-mixed concrete, is closely aligned to both the quantity of construction taking place and the general economy; therefore, it is deemed inappropriate to forecast future demand as this is unlikely to be linear. It is therefore not practicable to set a future baseline for resources, so future consumption is assumed to be the same as the current baseline, as outlined in **Table 20-1** and **Table 20-2**.

20.4.12 Potential recycled content for the main construction materials to be used during the construction of the Proposed Development is outlined in **Table 20-3**.

Table 20-3 Potential Recycled Content

Material type	Potential recycled content (% by weight)
Concrete	16
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Source: WRAP Designing Out Waste Tool for Civil Engineering

Mineral Safeguarding Areas, Allocated/Safeguarded Mineral and Waste Sites

20.4.13 The Site is located within FCC's administrative area.

20.4.14 As outlined on the FCC Proposal Map, there is an MSA (Policy EN23 Minerals Safeguarding) within the Site Boundary (Proposed CO_2 Connection Corridor).

20.4.15 As outlined on the FCC Proposal Map, the Site is not within any allocated/safeguarded mineral sites.

20.4.16 As outlined on the FCC Proposal Map, there is a Location for Waste Management Facilities (Policy EN21 Locations for Waste Management Facilities) which is within the Site Boundary (Indicative Enhancement Area). These are sites which are considered to be suitable in principle for waste management uses. However, as stated in the FCC LDP, *"there is no identified need for further recovery or disposal infrastructure within the County"* and *"no strategic allocations for waste management are identified within the LDP."*

Landfill Capacity

20.4.17 Baseline information is based on the estimated landfill void capacity in Wales for 2018 (latest available data) as outlined in NRW's Estimated Landfill Void in Wales data summarised in **Table 20-4.**

20.4.18 For non-hazardous waste, total landfill capacity in Wales (all types excluding non-hazardous restricted) at the end of 2018 was approximately 8.3 million m^3.

20.4.19 For inert waste, total landfill capacity in Wales at the end of 2018 was approximately 1.8 million m^3.

20.4.20 For hazardous waste, landfill capacity in Wales in 2018 was approximately 14,000 m^3. For hazardous waste, total merchant landfill capacity in England at the end of 2022 was approximately 7.9 million m^3. Hazardous restricted sites are not included since that capacity may not be available to the Proposed Development. Restricted landfills only accept waste from a limited number of sources and producers, commonly the site operator (e.g. a manufacturing site).

20.4.21 There is no publicly available information regarding any potential changes to landfill capacity that are likely to have occurred by the time of the Proposed

Development's construction and operation. Therefore, landfill capacity is assumed to remain the same as the current baseline.

Table 20-4 Landfill Capacity for Inert and Non-hazardous Waste in Wales

EPR Number	Type	Name	Area	Estimated remaining void space m^3
BP3330LS	Inert	Griffiths Griffith Wyn, Edward Lloyd and Gwenfrai Rees (Ty Mawr Farm)	North	397,791
FP3590LV		Clive Hurt (Plant Hire) Ltd	North	337,500
RP3337SE		Nant Newydd Quarry	North	262,500
WP3432SC		Treborth Leisure Ltd.	North	16,885
KP3795FU		Tarmac Ltd (Hendy Quarry)	South East	792,126
MP3036SS		Cemex UK Materials Limited	South East	33,750
Total inert capacity:				1,840,552
BU0800IZ	Non hazardous	FCC Environment (Llandullas)	North	167,922
PP3139GB		Cory Environmental Central Ltd - Hafod Quarry	North	2,218,538
GP3030BE		Corus UK Ltd	North	47,694
BT1908IX		JLA Disposal Ltd (Palleg Landfill)	South East	11,132
DP3732SQ		Cynon Valley Waste Disposal Company Ltd	South East	2,162,048
RP3733PC		Biffa Waste Services Ltd (Trecatti)	South East	441,915
DP3733BK		Newport City Council	South East	572,306
BP3339BH		RWE Npower plc (Aberthaw Quarry)	South East	520,584
BU8819IV		FCC Environment (Pwllfawatkin)	South West	74,492
VP3935AT		Cory Environmental (Gloucestershire) Ltd UK - Tir John	South West	174,587
MP3330WP		Resources Management UK Ltd (Withyhedge)	South West	1,773,391
BV7311IE		Tata Steel UK Limited (Port Talbot)	South West	122,843
Total non-hazardous capacity:				8,287,452

Source: NRW - Estimated Landfill Void in Wales data.

Waste Management Facilities

20.4.22 The IEMA Guidance (Materials and Waste) (page 14) "does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of

adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources." Therefore, a full list of waste management facilities is not included in the baseline.

20.4.23 The collated capacity of other types of waste management facilities is not publicly available for Wales; however, details of permitted waste sites are available on NRW's 'Find Details of Permitted Waste Sites' webpage. The map provides information on the type of waste facility, name of applicant, capacity and permit number.

20.4.24 For hazardous waste, the study area is Wales and England.

20.4.25 The operation waste from the Proposed Development are likely to comprise of waste from the site office, waste arising from routine maintenance activities on the CCGT and CCP, and waste arising from the CCP process. The types and volumes of CCP waste will depend on the final design, but may include flue-gas treatment effluent from water wash and/or acid wash processes containing amine degradation products and reclaimer effluent containing heat stable salts, unrecovered amine and amine degradation products which may be hazardous due to high pH content. Since some of the operational hazardous wastes likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g. liquid waste), hazardous operational waste will be compared to national (Wales and England) hazardous waste management facility capacity in the assessment.

20.4.26 Liquid hazardous waste from the Proposed Development's operation may be managed by high-temperature incineration or by physico-chemical treatment. Alternatively, in the longer term, some form of waste treatment may be developed on or near to the Proposed Development to manage waste generated in the CCP and other carbon capture facilities in the area, should other developments seek to undertake carbon capture. However, in the absence of such facilities, the assessment conservatively will not consider the potential for such waste treatment facilities to be developed.

20.4.27 As CCP technology has yet to be implemented at scale in the UK, there are no facilities that currently accept waste streams from CCP as there are no arisings in the UK. Consequently, the specific management route for CCP wastes will be determined in consultation with potential waste vendors following appointment of a contractor.

20.4.28 Due to the specialised nature of hazardous waste management, hazardous waste facilities typically receive wastes from a wide region; therefore, the assessment will consider the Wales and England capacity for managing hazardous wastes.

20.4.29 The collated capacity of hazardous waste management facilities is not publicly available for Wales. The capacity of waste management facilities is publicly available (e.g. EPR - Waste Sites) in England; however, the permitted capacity is not necessarily representative of the actual operational capacity of the infrastructure. Therefore, inputs data from the Environment Agency Waste Data Interrogator will be considered in the assessment.

Historic and Permitted Landfills

20.4.30 Historic landfills are potentially relevant to this assessment since excavations in historic landfill can give rise to waste that would subsequently require management. The Welsh Government's Data Map Wales identifies three historic landfill sites located within the Site Boundary.

20.4.31 Additional information on these landfill sites is presented in **Table 20-5**.

20.4.32 Three further historic landfill sites (Shotton Works - Area on North West Side of Interconnecting Road/ Shotton Works Number 1, Shotton Works (Broken bank Tip) and Broken Bank (Shotton Steelworks)) are within the Site (Existing Natural Gas Connection Corridor); however, no works are required in this area.

20.4.33 There are no permitted landfills within the Site Boundary.

Table 20-5 Historic Landfills

Site Name	Site Address	Licence Holder	Site Reference	Licence Issued	Licence Surrendered	Waste Type
Connah's Quay Power Station	Connah's Quay, Flintshire	Central Electricity Generating Board	A/L/10/11, B/RD/7/10	1977	1991	Inert, industrial and commercial
Connah's Quay Power Station 3	Ash Lagoon, Clwyd	Central Electricity Generating Board	No information	No information, first input 1962	No information	Inert and industrial
Connah's Quay Power Station No.1	Ash Lagoon, Clwyd	Central Electricity Generating Board	No information	No information, first input 1954	No information	Inert and industrial

Source: Data Map Wales.

Targets

20.4.34 The national target for recovery of construction and demolition (C&D) waste is 70% by weight, as set out in the EU Waste FD and Towards Zero Waste One Wales: One Planet – The Overarching Waste Strategy Document for Wales. The target specifically excludes naturally occurring materials with European Waste Catalogue (EWC) Code 17 05 04 (17 05 04 soil and stones other than those mentioned in 17 05 03* (soils and stone containing dangerous substances)). Recovery is deemed to include reuse, recycling and other recovery (e.g. energy recovery).

20.4.35 A good practice landfill diversion target of 90% has been achieved and exceeded by major UK developments as outlined in the IEMA Guidance (Materials and Waste). In 2020, the UK generated 59.1 million tonnes of non-hazardous C&D waste, of which 54.8 million tonnes was recovered. This represents a recovery rate of 92.6%.

20.4.36 Standard, good and best-practice recovery rates by material are provided by WRAP. Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in **Table 20-6**.

Table 20-6 Standard, Good and Best Practice Recovery Rates by Material

Material	Standard practice recovery (%)	Good practice recovery (%)	Best practice recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste (e.g. asbestos) must be landfilled.	

Source: WRAP

20.5 Impact Assessment Methodology

20.5.1 This section outlines the methodology that will be employed for assessing the likely significant effects associated with materials and waste. The criteria used for materials and waste align with topic-specific guidance in the IEMA Guidance (Materials and Waste), rather than the general significance criteria outlined in **Chapter 4: Project Alternatives and EIA Methodology**.

20.5.2 The IEMA Guidance (Materials and Waste) offers two methods for the assessment of waste. Method W1 – void capacity has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects.

20.5.3 The sensitive receptors for this assessment of construction impacts are:

- landfill void capacity in the expansive study area of Wales (non-hazardous landfill void capacity) and Wales and England (hazardous landfill void capacity) – as defined in the IEMA Guidance (Materials and Waste) *"landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment."*
- materials, Wales and GB/UK consumption of key construction materials – as outlined in the IEMA Guidance (Materials and Waste) "materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment."

20.5.4 The IEMA Guidance (Materials and Waste) "does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing

and recovery facilities are, hence, different to landfills, in that the latter are finite resources."

20.5.5 The assessment of materials and waste considers the following:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a licence, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- as part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and
- Minerals Planning Authorities (MiPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

Methodology for Determining Construction Effects

20.5.6 Materials will be used during the construction of the Proposed Development - the key construction materials expected to be used are steel, aggregates, asphalt and concrete.

20.5.7 Waste will be generated during construction of the Proposed Development. A large proportion of this waste will be reused, recycled or recovered.

Materials

20.5.8 Effects upon materials during construction of the Proposed Development will be assessed by:

- establishing the baseline for Wales, GB/UK consumption of key construction materials by weight;
- assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Proposed Development in construction;
- establishing the quantities of key construction materials required for the construction of the Proposed Development; and
- comparing the total quantities of key construction materials with the most recent national demand (utilising a percentage approach).

Waste

20.5.9 Effects upon waste during construction of the Proposed Development will be assessed by:

- establishing the baseline landfill void capacity in the expansive study areas;
- assessing the sensitivity of landfill void capacity;

- establishing the quantities of construction, demolition and excavation waste to be generated during the construction of the Proposed Development; and
- comparing the total waste arising from the construction of the Proposed Development against the landfill void capacity (using a percentage approach) assuming a worst case that waste goes to landfill.

Methodology for Determining Operational Effects

20.5.10 The sensitivity of receptors and magnitude of impacts for waste for operation will be assessed through the following:

- establishing the baseline landfill void capacity in the expansive study areas;
- assessing the sensitivity of landfill void capacity;
- establishing the quantities of operational waste to be generated during the operation of the Proposed Development;
- comparing the total waste arising from the operation of the Proposed Development against the landfill void capacity (utilising a percentage approach); and
- comparing operational hazardous waste arisings from the operation of the Proposed Development against national hazardous waste management facility waste inputs (England) and capacity (Wales) (utilising a percentage approach).

Assessment Criteria

Sensitivity

20.5.11 The sensitivity of materials relates to the availability and type of construction material to be consumed by the Proposed Development. The IEMA Guidance (Materials and Waste) criteria summarised in **Table 20-7** will be used to determine the sensitivity of materials.

Table 20-7 Criteria for Materials Receptor Sensitivity

Effects	Criteria for materials receptor sensitivity
Negligible	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock. *And/or* are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*
Low	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. *And/or* are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock.

Effects	Criteria for materials receptor sensitivity
	And/or are available comprising some sustainable features and benefits compared to industry-standard materials.
High	The key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock. *And/or* Comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	The key materials required for the construction of the Proposed Development are forecast to be insufficient in terms of production, supply and/or stock. *And/or* Comprise no sustainable features and benefits compared to industry-standard materials.

* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.

20.5.12 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development. As outlined in the IEMA Guidance (Materials and Waste) *"landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste".* The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends, where available, and information from relevant policy documents.

20.5.13 The criteria described within **Table 20-8** and **Table 20-9** will be used to determine the sensitivity of landfill capacity.

Table 20-8 Inert and Non-hazardous Landfill Capacity Sensitivity

Effects	Criteria for inert and non-hazardous landfill capacity
Across construction and/or operation phases, the baseline/future baseline (i.e. without development) of Wales inert and non-hazardous landfill void capacity is expected to…	
Negligible	Remain unchanged, or is expected to increase through a committed change in capacity.
Low	Reduce minimally by <1% as a result of wastes forecast.
Medium	Reduce noticeably by 1-5% as a result of wastes forecast.
High	Reduce considerably: by 6-10% as a result of wastes forecast.
Very High	is expected to reduce very considerably (by >10%); is expected to end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 20-9 Hazardous Landfill Capacity Sensitivity

Effect	Criteria for hazardous landfill capacity sensitivity
Across the construction and/or operation phases, the baseline/future baseline (i.e. without development) of national (Wales and England) hazardous landfill void capacity is expected to…	
Negligible	Remain unchanged, or is expected to increase through a committed change in capacity.
Low	Reduce minimally by <0.1% as a result of wastes forecast.

Medium	Reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	is expected to reduce very considerably (by >1%); is expected to end during construction or operation; is already known to be unavailable, or; would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude

20.5.14 The magnitude of impact describes the degree of variation from the baseline conditions as a result of the Proposed Development. The methodology for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The IEMA Guidance (Materials and Waste) criteria used to assess the magnitude of impact for materials are provided within **Table 20-10.**

Table 20-10 Materials Magnitude of Impact

Effects	Criteria for materials magnitude of impacts
No change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the Wales and GB/UK baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the Wales and GB/UK baseline availability.
Moderate	Consumption of one or more materials is between 6-10% by volume of the Wales and GB/UK baseline availability.
Major	Consumption of one or more materials is >10% by volume of the Wales and GB/UK baseline availability.
	*a Wales and GB/UK baseline is used in the absence of Wales construction material consumption data (e.g. for steel).

20.5.15 The methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction of the Proposed Development on the baseline landfill capacity. The IEMA Guidance (Materials and Waste) criteria used to assess the magnitude of impact for inert and non-hazardous waste, and hazardous waste, are provided within **Table 20-11**.

Table 20-11 Waste Magnitude of Impact

Effects	Criteria for inert and non-hazardous waste magnitude of impacts	Criteria for hazardous waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development	Zero waste generation and disposal from the Proposed Development
Negligible	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by <1%	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by <0.1%
Minor	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by 1-5%	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by <0.1-0.5%

Effects	Criteria for inert and non-hazardous waste magnitude of impacts	Criteria for hazardous waste magnitude of impacts
Moderate	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by 6-10%	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by <0.5-1%
Major	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by >10%	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline* by >1%
	*forecast as the worst-case scenario, during a defined construction and/or operational phase.	*forecast as the worst-case scenario, during a defined construction and/or operational phase.

Potential Effects

20.5.16 **Table 20-12** describes the IEMA Guidance (Materials and Waste) effect thresholds used in determining the effects. **Table 20-13** shows the likely significance of the effect.

Table 20-12 Effect Thresholds

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity of Receptor	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Table 20-13 Likely Significance of Effect

Effect	Materials	Waste
Neutral	Not significant	Not significant
Slight		
Moderate	Significant	Significant
Large		
Very Large		

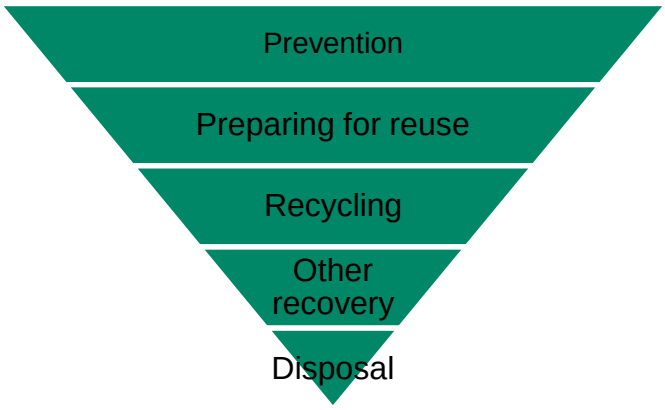
20.6 Embedded Mitigation

20.6.1 The Proposed Development will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy[448] (**Plate 20-1**).

20.6.2 The following mitigation measures will be considered and implemented where applicable during the design phases and subsequent construction work:

- design for reuse and recovery: identifying, securing and using materials that already exist on-site, or can be sourced from other projects;
- design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;
- design for off-site construction: maximising the use of prefabricated structure and components, encouraging a process of assembly rather than construction;
- design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how deconstructability and demountability of elements can be maximised at end of first life; and
- design for waste and material asset efficient procurement: identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard.

Plate 20-1 The Waste Hierarchy, from Defra's Guidance on Applying the Waste Hierarchy, recreated by AECOM



20.6.3 The construction of the Proposed Development would be subject to measures and procedures defined within a final CEMP. The CEMP would include the implementation of industry standard practice and control measures for environmental impacts arising during construction, such as the control of dust and the approach to waste management on-site. A Framework CEMP will be included alongside the Application; the construction contractor will use this document to produce their final CEMP prior to works commencing on-site. An Outline Site Waste Management Plan

[448] Defra, 2011; Guidance on Applying the Waste Hierarchy.

(OSWMP) will be included within the Framework CEMP; the construction contractor will use this document to produce their SWMP prior to works commencing on-site.

20.6.4 Excavated material will be managed in accordance with the appropriate exemption and/or environmental permit or, if applicable, a Materials Management Plan (MMP) will be developed under the CL:AIRE Definition of Waste: Development Industry Code of Practice by the construction contractor. This will support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse/off-site disposal of materials and ensure compliance with regulatory guidance.

20.6.5 Embedded mitigation measures will be considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice, i.e. do not take account of such measures even though they are likely to be standard practice and/or form part of the design of the Proposed Development. These will then be followed through the assessment to ensure that realistic likely environmental effects are identified. Embedded mitigation will be described within the ES with the rationale for the inclusion clearly stated.

20.7 Potential Effects

20.7.1 Due to the limitation on information available at this stage, and the uncertainty about the nature of mitigation(s) and the method by which mitigation(s) would be secured, material use and waste generation during the construction and waste generation during operation of the Proposed Development is scoped into the assessment.

20.7.2 The following matters are proposed to be scoped out of the materials and waste assessment:

- waste arising from extraction, processing and manufacture of construction components and products. This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and, therefore, outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured;
- other environmental impacts associated with the management of materials and waste to or from the Proposed Development (e.g. on water resources, air quality, noise or traffic) resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste are addressed separately in other relevant chapters;
- direct impacts on safeguarded/allocated mineral sites. The Site Boundary is not within any such sites;
- direct impacts on safeguarded/allocated waste sites. No strategic allocations for waste management are identified within the LDP;

- direct impacts on MSAs, as they are not considered in the materials and waste assessment (MSAs will be considered within the Planning Statement to accompany the DCO Application);
- effects on the availability of materials during operation. Forecast effects are (using professional judgement) considered negligible in relation to the scale and nature of the Proposed Development; and
- effects associated with decommissioning. The Proposed Development has a long design life and as such it is not considered practicable to reliably forecast decommissioning requirements and infrastructure far in the future.

20.8 Additional Mitigation

20.8.1 Where likely significant adverse effects are anticipated and it is reasonably practicable to mitigate the likely significant effect, additional mitigation will be provided, where reasonably practicable.

20.9 Summary of Potential Likely Significant Effects

20.9.1 A summary of elements proposed to be scoped into or out of future assessment is provided in **Table 20-14**.

Table 20-14 Summary of the Potential Likely Significant Effects to be Considered in the ES

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Materials and Waste			
Construction	Changes in availability of materials. Changes in available landfill void capacity.	Changes to allocated/safeguarded mineral site. Changes to allocated/safeguarded waste site. Changes to MSAs	There are no allocated/safeguarded mineral or waste sites present within the Site Boundary. MSAs are not considered in the materials and waste assessment.
Operation	Changes in available landfill void capacity. Changes in available hazardous waste management facility capacity.	Waste arising from extraction, processing and manufacture of construction components and products.	This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and, therefore, outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured. Other environmental impacts associated with the management of waste are addressed separately in other relevant chapters.
		Other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water resources, air quality, noise or traffic) resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste.	
		Changes in availability of materials.	
		Changes to allocated/safeguarded mineral site. Changes to allocated/safeguarded waste site. Changes to MSAs.	Forecast effects are (using professional judgement) considered negligible in relation to the scale and nature of the Proposed Development. There are no allocated/safeguarded mineral or waste sites present within the Site Boundary. MSAs are not considered in the materials and waste assessment.

Topic	Scoped In	Scoped Out	Rationale for Scoping Out
Decommissioning		Waste arising from extraction, processing and manufacture of construction components and products.	This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and, therefore, outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.
		Other environmental impacts associated with the management of materials and waste to or from the Proposed Development (e.g. on water resources, air quality, noise or traffic) resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste.	Other environmental impacts associated with the management of materials and waste are addressed separately in other relevant chapters.
		Changes in availability of materials.	The Proposed Development has a long design life and as such it is not considered practicable to reliably forecast decommissioning requirements and infrastructure far in the future.
		Changes in available landfill capacity	
		Changes to allocated/safeguarded mineral site.	There are no allocated/safeguarded mineral or waste sites present within the Site Boundary.
		Changes to allocated/safeguarded waste site.	MSAs are not considered in the materials and waste assessment.
		Changes to MSAs.	

21. Cumulative and Combined Effects

21.1 Introduction

21.1.1 This chapter sets out the proposed scope and methodology for the assessment of cumulative and combined effects as a result of the Proposed Development. The following types of cumulative effects will be considered within the ES:

- **inter-project Cumulative effects:** these occur when the environmental impacts and effects of the Proposed Development interact with those associated with other planned projects and developments located within a realistic geographical scope where environmental impacts could act together to result in a greater significance of effect on environmental resources and/or receptors; and
- **intra-project combined effects**: these are effects resulting from the Proposed Development on any one receptor that may collectively cause an effect/effects of greater significance, on environmental resources and/or receptors.

21.1.2 Due to the potential for cumulative effects to occur as a result of the construction and operation (including maintenance) of the Proposed Development, a cumulative assessment will be undertaken as part of the EIA in accordance with the EIA Regulations. The assessment of cumulative effects will follow the approach outlined by the PINS Advice Note 17: Cumulative Effects Assessment[449].

21.1.3 It is proposed that the potential for cumulative effects as a result of decommissioning is scoped out of the assessment as the operating life of the Proposed Development is assumed to be 30 years and, therefore, sufficient information on planned projects and developments is not yet available to inform a cumulative assessment of decommissioning impacts.

21.2 Inter-project Cumulative Effects with Other Developments

21.2.1 The assessment methodology for inter-project Cumulative Effects will involve the identification of incremental changes to baseline conditions likely to be caused by other relevant projects together with the Proposed Development. The PINS's Advice Note 17 on the assessment of cumulative effects identifies a four-stage approach as follows:

Stage 1: Establish the Zone of Influence and identify long list of 'other developments'

21.2.2 The ZoI of the Proposed Development, within which any potential effects of the Proposed Development may combine with the effects arising from other developments, will be determined on the basis of the maximum study areas

[449] PINS, 2019; *Advice Note Seventeen: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/ (Accessed 20/12/2023)

of the technical assessments considered within the ES. It is considered that a study area of 15 km from the Site encompasses the maximum range of any potential likely significant cumulative effects.

21.2.3 Stage 1 involved establishing the Proposed Development's ZoI and identifying a long list of 'other development', as shown in **Appendix D**. A level of certainty from Tier 1 (most certain) to Tier 3 (least certain), as defined within PINS Advice Note 17, was applied to 'other development'.

21.2.4 The following data sources were used to identify 'other development':

- National Infrastructure Planning website[450];
- FCC[451];
- Wirral Council[452]; and
- Cheshire West and Chester Council[453].

21.2.5 The following criteria have been used to compile the initial longlist, as provided in **Appendix D**, and to screen out development of insufficient scale or of a type that would not result in cumulative effects with the Proposed Development:

- any planning applications older than five years at the commencement date of study;
- construction of small-scale agricultural buildings;
- house extensions or cosmetic changes to buildings;
- work to trees;
- micro-generation wind turbines;
- roof mounted solar PV panels (or ground mounted less than 50 kW output);
- renewal of planning permission for retention of existing operational use;
- variation to planning permission for retention of exiting operational use;
- variation to planning permissions, including reserved matters applications (where the original application would not have been considered within the assessment); and
- small-scale residential uses (specifically, less than 20 dwellings) or changes of buildings' use (unless it could itself result in a cumulative effect, such as a conversion of several barns into a holiday village.

[450] PINS, 2023; *National Infrastructure Planning* [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/ (Accessed 20/12/2023).
[451] FCC, 2023; *Flintshire County Council Planning* [online]. Available at: https://www.flintshire.gov.uk/en/Resident/Planning/Home.aspx (Accessed 20/12/2023).
[452] Wirral Council, 2023; *Wirral Council Planning and Building* [online]. Available at: https://www.wirral.gov.uk/planning-and-building (Accessed 20/12/2023).
[453] Cheshire West and Chester Council, 2023; *Chesire West and Chester Planning and Building Control* [online]. Available at: https://www.cheshirewestandchester.gov.uk/residents/planning-and-building-control (Accessed 20/12/2023).

Stage 2: Establishing a shortlist of 'other existing development and/or approved development'

21.2.6 To provide a proportionate cumulative effects assessment, a short list has been established from the longlist (Stage 1) of other existing development and/or approved development. To create the short list (Stage 2), the following criteria was used:

- listed on the National Infrastructure Planning Programme of Projects within 15 km of the Site Boundary;
- applications for EIA development within 3 km of the Site Boundary;
- other, major applications that are not EIA development within 1 km of the Site Boundary; and
- other schemes that do not meet the above criteria but which the Applicant wishes to include or a statutory stakeholder specifically requests is included. This may include development allocations identified in the relevant Development plan (and emerging Development Plans) for example, which are aspirational but have not yet reached pre-application stage.

21.2.7 The indicative shortlist of other developments identified for the inter-project cumulative effect assessment is provided in **Table 21-1**. **Figure 21-1 (Appendix A)** shows the location of the cumulative schemes in relation to the Proposed Development. The shortlist of cumulative schemes will be fixed approximately three months prior to ES submission to allow sufficient time for the technical assessments to consider the cumulative schemes.

Table 21-1 Shortlist of other developments to be considered in the cumulative impact assessment

Application	Brief Description	Approximate Distance from Main Site
HyNet Carbon Dioxide Pipeline [HyNet CO_2 Pipeline Project]	A new build CO_2 pipeline that will transport CO_2 produced and captured by future hydrogen producing facilities and existing industrial premises in North West England and North Wales for offshore storage. The CO_2 pipeline will comprise both newbuild and existing pipelines (and newbuild and existing above-ground installations (AGI) to allow operation and maintenance works in relation to the pipeline, including the newbuild Proposed Flint AGI) that will be covered under the DCO. When complete it will run from the Ince AGI in Cheshire to Talacre Beach in North Wales.	1.4 km
FUL/000034/22	Construction of a residential development of 141 no. dwellings and associated works	1.4 km
60765	Installation and operation of ground mounted solar panels and associated infrastructure	1.95 km
SCO/000970/23	EIA Scoping Opinion Request for the construction and operation of carbon capture technology	2.95 km
DNS/000140/22	Development of National Significance of Solar Farm to include: Solar PV Modules mounted onto frames to form arrays; Transformer units; DNO substation; Fencing & Security measures; Access tracks; Onsite cabling;	11.1 km

Application	Brief Description	Approximate Distance from Main Site
	Outdoor classroom; Car Parking spaces; Offsite connecting the DNO substation on-site to the Saltney Primary substation via grid connection; Landscaping; Temporary construction compound; Associated Site works	
Hydrodec Oil Re-Refinery Eastham	The construction of a new hazardous waste recovery facility at Power House Road, Eastham, Port Wirral, Merseyside comprising the construction and operation of a waste oil re-refining plant together with associated and ancillary development.	13.25 km

21.2.8 The Applicant is also aware of the recently announced North Wales Railway Electrification project which is likely to be located in close proximity to the Proposed Development (the North Wales Main Line railway is located immediately south of the Main Site). This will be further considered during the PEIR and ES if and when detailed information becomes available.

21.2.9 As discussed in paragraph 2.1.28, the HyNet CO_2 Pipeline Project is expected to be constructed and operational prior to construction of the Proposed Development and intersect the Proposed CO_2 Connection Corridor. However, the works for this separate application may be delayed and coincide with those of the Proposed Development. In order to assess the worst-case scenario, the HyNet CO_2 Pipeline Project has been included in the shortlist of other developments.

Stage 3: Information Gathering

21.2.10 The shortlist will be agreed with the relevant planning authority/authorities during the preparation of the PEIR and the ES and information on the other developments will be compiled to inform the assessment. Key details of the information gathered will be captured and presented in the ES.

Stage 4: Assessment

21.2.11 Consideration will be given within the ES, as relevant, to those shortlisted schemes which may result in cumulative effects together with the Proposed Development from the perspective of each relevant technical assessment. It should be noted that some of the schemes that meet the above criteria may be due to be occupied prior to the start of the construction. As a result, these schemes may be considered as 'built' within the EIA scenarios and included as part of the existing or future baseline.

21.2.12 For the majority of topics, the assessment of cumulative effects will be a qualitative assessment and will be reported as a collective assessment of the cumulative schemes rather than an assessment of each individual cumulative scheme identified. The ES will describe mitigation measures for any identified likely significant inter-project cumulative effects and, where appropriate, any proposed monitoring required.

21.3 Intra-project Combined effects

21.3.1 There is no established EIA methodology for assessing and quantifying effect interactions that lead to combined effects on sensitive receptors; however, the European Commission (EC) has produced guidelines for

assessing effect interactions "*which are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project* [454] *…*".

21.3.2 An approach has been developed in line with these guidelines which uses the defined residual effects of the Proposed Development to determine the potential for effect interactions that lead to combined effects. The EIA will predict beneficial and adverse effects during construction, operation and decommissioning of the Proposed Development, which are classified as minor, moderate or major. Several effects on one receptor or receptor group could theoretically interact or combine to produce a combined significant overall effect. An exercise which tabulates the effects on receptors or receptor groups will be undertaken to determine the potential for effect interactions and therefore any combined effects. Only adverse or beneficial residual effects classified as minor, moderate, or major will be considered in relation to potential effect interactions. Residual effects, which are classified as negligible, will be excluded from the assessment of the effect interactions as, by virtue of their definition, they are considered to be imperceptible effects to an environmental / socio-economic resource or receptor.

[454] European Commission (EC), 1999; *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*. Luxembourg: Office for Official Publications of the European Communities.

22. Aspects to be Scoped Out

22.1 Shipping and Navigation

22.1.1 Technical studies considering how construction materials will be brought to Site are ongoing. A number of routes are under consideration to bring AIL to the Site. Further detail will be provided in the ES.

22.1.2 The Port of Mostyn ('the Port') may be used for the shipborne delivery of the largest AIL during construction of the Proposed Development. Impacts and effects in relation to shipping and navigation therefore require consideration, including effects of transportation of AIL by vessel to the Port. Shipping and navigation have been identified as a potential receptor during the construction phase due to potential interactions between existing vessel traffic in the River Dee and the works proposed within the Water Connection Corridor during the installation phase of the potential new, or works to the existing, abstraction and discharge infrastructure.

Baseline Conditions

22.1.3 The River Dee is navigable by suitable craft from the sea up to its tidal limit at Chester. Safety of navigation in the Dee Estuary is managed through the Jointly Agreed Procedures Agreement between the Port and the Dee Conservancy[455].

22.1.4 The Port is privately owned and operated and located approximately 16 km downstream of the existing Connah's Quay Power Station in the outer estuary of the River Dee. The Dee Conservancy is the harbour, navigation and local lighthouse authority for most of the Dee Estuary; it is used for commercial and recreational activities including navigation, fishing, sailing, power boating, water skiing, wind-surfing, bird watching, wildfowling and walking[456].

22.1.5 There are three areas of jurisdiction within the Dee Estuary. Two are the responsibility of the Port, the third resting with the Dee Conservancy:

- the Port is the Statutory Harbour Area (SHA) for all the berths and their immediate approach areas;
- the Port is also the Competent Authority for pilotage in the Dee Estuary Pilotage Area which extends from a seaward point off Point of Ayr upstream to the Old Stone Bridge at Chester; and
- the Dee Conservancy is the SHA for the remainder of the estuarine area.

22.1.6 Historically, the Port has handled industrial cargoes for the region's heavy industries. A large portion of the Port's business is now dedicated to the offshore renewable energy sector, making it one of the main locations in Europe for the assembly and installation of turbines. The privately owned Corus jetty, located immediately upstream of the A548 bridge on the north

[455] The Port of Mostyn Limited, 2023; *Safety of Navigation* [Online]. Available at: https://www.portofmostyn.co.uk/pilotage/safety-of-navigation/ (Accessed 20/12/2023).
[456] Environment Agency Wales, 2023; *Marine Safety in the Dee Conservancy* [Online] Available at: https://www.liverpool.ac.uk/~cmi/dee/deeconsafety1.pdf (Accessed 20/12/2023).

bank of the river, was used to receive industrial cargo but has not been operational since the 1990s.

22.1.7 Automatic Identification System (AIS) data can be used to provide an insight into the average vessel density in an area. AIS data for 2017 – 2022[457],[458] indicates that vessel movements are focused around the Port, with few vessels travelling further upstream than Kingspan, approximately 8.7 km downstream of Connah's Quay Power Station. Vessels that travel this far up the River Dee, or beyond, appear to be service vessels such as dredgers, and few in number. As only vessels over 15 m are required to carry AIS transmitters, there may be a number of smaller vessels travelling up river not covered by AIS data.

22.1.8 The maximum draught practicable for access to Connah's Quay and Steelworks Wharf (further upstream of the Proposed Development) at MHWS is between 2 m and 3.8 m[459,460]. However, while historically, large vessels (100 tonnes to 150 tonnes) have been known to reach Chester Wharf, only vessels with a draft of less than 0.9 m can travel beyond Chester Weir at high tide[461]. The Flintshire Bridge (A548) now restricts the movement of large vessels travelling up river of the Proposed Development. Therefore, it is likely that vessels accessing the river beyond the Proposed Development are used for leisure purposes and commonly less than 10 m in length.

22.1.9 The Proposed Development is located where the Dee Estuary narrows into the River Dee. A small number of vessels are expected to use this part of the estuary, primarily smaller, privately operated recreational boats.

Scope of Assessment

22.1.10 Industry good practice will be implemented as embedded mitigation where necessary, including the communication of relevant information to other users of the Dee Estuary via Notices to Mariners (NtM), Radio Navigation Warnings Navigational Telex (NAVTEX) and/or broadcast warnings, plus the use of temporary aids to navigation as required to guide vessels around areas of installation activity.

22.1.11 There is the potential for a Jack Up Barge (JUB) to be used to install and remove the cofferdam, the likely extents of which will not obstruct the estuary On this basis, there is limited potential for significant effects to other mariners during construction works within the Water Connection Corridor, and the following potential impacts are proposed to be scoped out of the EIA:

- displacement resulting in increased vessel-to-vessel collision risk between third-party vessels;

[457] European Marine Observatory and Data Network (EMODnet), 2022; *Route Density Annual Totals 2019 – 2022* [Online] Available at: https://emodnet.ec.europa.eu/en/human-activities (Accessed 20/12/2023).
[458] European Marine Observatory and Data Network (EMODnet), 2023; *Route Density Annual Totals 2019 – 2022* [Online] Available at: https://emodnet.ec.europa.eu/en/human-activities (Accessed 20/12/2023).
[459] Michael, C, 2023; *Boat cruising in the Dee Estuary. University of Liverpool* [Online] Available at: https://www.liverpool.ac.uk/~cmi/dee/dee.html#:~:text=The%201948%20Admiralty%20Pilot%20gives,ft)%3B%20Saltney%20(9%20ft (Accessed 20/12/2023).
[460] Garmin Navionics, 2023; *Navionics Nautical Chart Viewer* [Online]. Available at: https://webapp.navionics.com/#boating@6&key=kydfInboQ (Accessed 20/12/2023).
[461] National Association of Boat Owners (NABO), 2006; *NABO Cruising Notes River Dee & Shropshire Union Canal (Dee Branch)* [Online] Available at: https://www.nabo.org.uk/files/members/dee_notes.pdf (Accessed 20/12/2023).

- third-party to project vessel collision;
- deviation from established and identified vessel routes; and
- interaction with vessel anchors and anchoring activity.

22.1.12 Any specific control measures will be informed by engagement with the Harbour Authority, Trinity House and any other stakeholders, as required (with reference to NPS EN-1; paragraph 5.8.18).

22.1.13 The Proposed Development is considered unlikely to obstruct such vessels from continued access to the river during its operation (**Figure 1-3** (**Appendix A**)).

22.2 Commercial Fisheries

Baseline Conditions

22.2.1 The Study Area for commercial fisheries comprises the Dee Estuary, located within ICES rectangle 35E6[462].

22.2.2 The Dee Estuary supports relatively stable and profitable shellfish and finfish fisheries, managed by the North Western Inshore Fisheries and Conservation Authority (NWIFCA). This predominantly comprises a large cockle *Cerastoderma edule* fishery of high economic importance, and a smaller mussel *Mytilus edulis* fishery[463].

22.2.3 All cockle fisheries within the Dee Estuary are controlled via The Dee Estuary Cockle Fishery Order 2008[464], the limits of which are located approximately 2.5 km north-west (downstream) of the Proposed Development. The cockle fishery opens from July to December inclusive, with approximately 15 small (<10 m in length) vessels active[465].

22.2.4 Out of season fishers switch target catch to the mussel beds located near West Kirby and Thurstaston[466,467], more than 12.5 km downstream of the Proposed Development.

22.2.5 In addition, there is low intensity collection of razor fish *Ensis spp*. and bait digging for lug worms *Arenicola marina*, particularly on the North Wirral foreshore[468].

22.2.6 Additional fisheries of importance include salmon *Salmo salar* and sea trout *Salmo trutta*, controlled by a Net Limitation Order which applies to estuaries

[462] ICES, 2009; *ICES Statistical Rectangles* [Online] Available at: https://gis.ices.dk/geonetwork/srv/eng/catalog.search#/metadata/81f68a99-9b91-4762-80d3-31c069731f44 (Accessed 20/12/2023).
[463] NRW, 2022; *Know Your River –Dee Salmon & Sea Trout Catchment Summary* [Online] Available at: https://naturalresources.wales/media/696144/complete-accessible-dee-kyr-2022.pdf (Accessed 20/12/2023).
[464] The Dee Estuary Cockle Fishery Order 2008 (SI 2008/1472). London: HMSO.
[465] NWIFCA, 2017; *Fisheries in EMS Habitats Regulations Assessment for Amber and Green risk categories* [Online] Available at: https://www.nw-ifca.gov.uk/app/uploads/NWIFCA-DE-EMS_Size_Mussel_2017_Final.pdf (Accessed 20/12/2023).
[466] NWIFCA, 2023a; *West Kirby Mussel Inspection 23-05-23* [Online] Available at: https://www.nwifca.gov.uk/app/uploads/West-Kirby-Mussel-Inspection-23-05-23.pdf (Accessed 19/12/2023).
[467] NWIFCA, 2023b; *Thurstaston Mussel Inspection 23-05-23* [Online] Available at: https://www.nwifca.gov.uk/app/uploads/Thurstaston-Mussel-Inspection-23-05-23.pdf (Accessed 19/12/2023).
[468] Natural England & Countryside Council for Wales, 2010; *The Dee Estuary European Marine Site* [Online] Available at: https://naturalresources.wales/media/673576/Dee%20Estuary-Reg33-Volume%201-English-091209_1.pdf (Accessed 20/12/2023).

around the coast of Wales[469]. There is also a fishery for flounder *Pleuronectes flesus*, mullet species *Chelon labrosus*, cod *Gadus morhua*, and brown shrimp *Crangon crangon* (between May and July) in the region.

Scope of Assessment

22.2.7 The Proposed Development is located where the Dee Estuary narrows into the River Dee. While this is within tidal influence, and therefore part of the estuary, this location is situated away (>8 km) from the identified areas where fishers focus their effort further downstream, in the wider part of the estuary. This narrow part of the Estuary may be subject to a low level of hand raking for cockle and mussel, but it is not considered to provide significant commercial opportunities.

22.2.8 Furthermore, it is not anticipated that the cofferdam installed as part of the Proposed Development's activities will obstruct migratory fish and other river users from passage up and down stream of the River Dee at low tide. As such, the Proposed Development is not considered likely to cause obstruction to migratory fish species, such as salmon and trout.

22.2.9 Thus, with consideration of the MCAA 2009; the Fisheries Act 2020[470]; NPSs EN-1 and EN-4; and NWIFCA Annual Plan 2022 to 2023[471], the following potential impacts are proposed to be **scoped out** of the EIA:

- obstruction of navigation routes to commercial fishing grounds;
- direct loss and alteration of fishing grounds;
- displacement of commercial fishing activities;
- loss or damage to fishing gear; and
- indirect effects on commercial fisheries as a result of impacts on the ecology of commercial species.

22.3 Transboundary Effects

Baseline Conditions

22.3.1 A transboundary effect is defined under Regulation 32(1) of the EIA Regulations as any significant adverse effect on the environment resulting from human activity, the physical origin of which is situated wholly or in part within an area under the jurisdiction of another European Economic Area (EEA) State.

22.3.2 The nearest EEA State to the Site is Ireland, located approximately 195 km west of the Site. The Site is located within a Ramsar site, SPA, and SAC, all of which are internationally designated sites referred to as Habitats Sites (formerly known as European Sites).

[469] NRW. (2018). *New fishing controls for the cross-border rivers Dee and Wye: proposed application to Welsh Government for confirmation of new fishing byelaws for salmon and sea trout. Board Paper* [Online] Available at: https://cdn.cyfoethnaturiol.cymru/media/686538/nrw-board-fishing-byelaws-dee-wye-july-2018.pdf?mode=pad&rnd=131800899350000000 (Accessed 20/12/2023).
[470] *Fisheries Act 2020* (c. 22). London: HMSO.
[471] NWIFCA, 2022; *Annual Plan* [online]. Available at: https://www.nw-ifca.gov.uk/app/uploads/NWIFCA-Annual-Plan-22-23.pdf (Accessed 19/12/2023).

22.3.3 The Site is located within 2 km of the England / Wales border (straight line). England and Wales are constituent countries of the United Kingdom and are not considered separate EEA States for the purpose of transboundary effects under the EIA Regulations. However, due to devolved legislation and separate relevant authorities, the potential for transboundary effects across the England / Wales border will be considered. A screening matrix for the consideration of transboundary effects is provided in **Appendix E**.

Scope of Assessment

22.3.4 The study area for assessment of the Proposed Development has not exceeded 15 km in any chapter of this report. Due to the distance to the nearest EEA State, it is considered unlikely that any impacts that arise from the Proposed Development would generate any significant effect to any receptor in any other EEA State.

22.3.5 Potential impacts and the potential for likely significant effects on relevant qualifying features of internationally designated Habitat Sites will be considered and presented within a HRA Report that will accompany the DCO Application. It is currently anticipated that a Draft Shadow HRA Report will be presented for statutory consultation alongside the PEIR. Impacts and effects will also be described in **Chapter 8: Terrestrial and Aquatic Ecology**, **Chapter 9: Marine Ecology** and **Chapter 14: Physical Processes**. Therefore, no separate assessment of impacts to these sites will be required for transboundary considerations.

22.3.6 All works associated with the Proposed Development fall within the jurisdiction of Wales. All aspects of the Proposed Development within 2 km of the England / Wales border are those aspects for which it is assumed no permanent works will be required for the Proposed Development (Existing Natural Gas Connection Corridor). All known permanent works associated with the Proposed Development are located over 2 km from the England / Wales border.

22.3.7 Where the study area for individual assessments within this report exceeds 2 km, any potential impacts to receptors within England will be considered and included within the assessment as detailed within the respective chapter. Therefore, no separate assessment of impacts to these receptors will be required for constituent country transboundary considerations.

22.3.8 Therefore, with consideration of NPS EN-1 (paragraph 4.3.3), the following potential effects are proposed to be **scoped out** of the EIA:

- transboundary effects to other EEA States;
- transboundary effects to internationally designated sites; and
- transboundary effects between England and Wales.

22.4 Aviation

Baseline Conditions

22.4.1 Hawarden Airport is located 6.9 km to the south-east of the Site. The runway is located 7.8 km of the Site and orientated north-east to south-west, with

take-off routes running perpendicular to the Proposed Development. There are no other airports within 15 km of the Site.

22.4.2 The Site is not within any Aerodrome Safeguarding Area for any airport.

22.4.3 The Civil Aviation Authority (CAA) has a general interest in charting all known structures of 91.4 m (300 feet) AGL, or higher, as air navigation obstacles. Article 109A of the Air Navigation Order 2000[472] requires that the owners of obstacles which exceed 150 m AGL fit such obstacles with warning lights. The tallest existing structure in the existing landscape of the Site is the stack at enfinium's Parc Adfer combined heat and power waste to energy facility at approximately 85 m in height.

Scope of Assessment

22.4.4 The absorber stack(s) of the Proposed Development are expected to reach circa 105 m indicative height AGL, and therefore will be of interest to the CAA. However, these are the only structure(s) of the Proposed Development which are expected to exceed 91.4 m AGL. With suitable aviation warning lighting on and charting secured through the draft DCO, it is anticipated that any risks to aviation will be suitably mitigated.

22.4.5 Potential impacts to aviation traffic associated with Hawarden Airport are considered unlikely as a result of the distance of the facility and runway orientation. It is anticipated that routine aviation operation would not create any conflict with the Proposed Development.

22.4.6 Temporary construction crane(s) can be significant structures (up to approximately 170 m AGL). The Applicant will be required to inform the CAA no less than 40 working days in advance of the erection of any such crane via the Airspace Coordination and Obstacle Management Service[473]. The Applicant will comply with any instructions relating to the management of relevant crane(s) that may be issued by the CAA. It is anticipated that such measures will suitably mitigate risks to aviation safety, and that such risks would be considered to be as low as reasonably practicable, for the reasons specified above.

22.4.7 The CAA will be consulted on the Proposed Development to review any requirements for aviation lighting on the stack(s) and enable the Proposed Development to be charted in the future.

22.4.8 Therefore, with consideration of NPS EN-1 (Section 5.5), the following potential impacts are proposed to be **scoped out** of the EIA:

- risk to aviation during construction of the Proposed Development (relating to cranes);
- risk to aviation during operation of the Proposed Development (relating to height of absorber stack(s)); and
- risk to the Proposed Development from aviation.

[472] *The Air Navigation Order 2000* (SI 2000/1562). London: HMSO.
[473] CAA, 2023; *Crane notification* [online]. (Accessed 11/12/2023).

22.5 Electronic Interference and Electro-Magnetic Fields

Baseline Conditions

Electronic Interference

22.5.1 The introduction of new structures of significant height and bulk into an environment can cause disruption to the reception of electromagnetic waves. Although this effect relates to both radio and TV signals, TV reception is potentially more affected and, as such, only TV reception has been considered.

22.5.2 Office of Communications (Ofcom) guidance 'Tall structures and their impact on broadcast and other wireless services'[474] states, in relation to electronic interference that 'Problems are more likely to occur if a building or structure is constructed which is significantly taller than those around it, or is on high ground' and that the 'shadow' (interference) caused by a tall structure between a transmitter and receiver disappears 1-5 km away from the tall structure.

22.5.3 The Main Site includes the existing Connah's Quay Power Station, a four-unit combined CCGT plant providing 1380 MW of dispatchable power exported to the National Grid. The tallest structures associated with the existing Connah's Quay Power Station are the four HRSG stacks at 85 m high; the tallest adjacent building is the HRSG building at 36.5 m high.

22.5.4 The tallest existing structure in the existing landscape of the Site is the stack at enfinium's Parc Adfer combined heat and power waste to energy facility at approximately 85 m in height.

Electro-Magnetic Fields

22.5.5 Electro-Magnetic Field (EMF) effects must be controlled in accordance with the Control of Electromagnetic Fields at Work Regulations 2016[475], which sets out how employers must make and implement action plans to ensure compliance with the defined exposure limits.

22.5.6 The Electrical Connection Corridor includes the existing National Grid 400 kV Deeside Substation. Additionally, the existing 132 kV substation operated by SPEN is located approximately 500 m east of the Main Site and adjacent to the Indicative Enhancement Area. Existing 132 kV and 400 kV overhead lines and underground cables are located in the vicinity of these substations.

22.5.7 The nearest residential properties to the Main Site are located on Kelsterton Road, approximately 25 m south of the Main Site. The towns of Connah's Quay/Deeside and Flint are located within 1 km of the Site.

[474] Ofcom, 2009; *Tall structures and their impact on broadcast and other wireless services* [online]. Available online: https://www.ofcom.org.uk/__data/assets/pdf_file/0026/63494/tall_structures.pdf (Accessed 18/12/2023)
[475] *The Control of Electromagnetic Fields at Work Regulations 2016* (SI 2016/588). London: HMSO.

Scope of Assessment

Electronic Interference

22.5.8 It is anticipated that the tallest structure(s) associated with the Proposed Development would be the CCP absorber stack(s) at circa 105 m indicative height AGL. With the exception of these, the Proposed Development is not likely to introduce new permanent buildings or structures that are significantly taller than those around it, including, notably, the tallest existing structure in the existing landscape of the Site, which is the stack at enfinium's Parc Adfer combined heat and power waste to energy facility at approximately 85 m in height.

22.5.9 The temporary construction crane(s) are anticipated to be circa 170 m in height and, therefore, will be higher than the existing structures in the surrounding area. The siting of the crane(s), however, will be temporary during the construction phase.

22.5.10 Although new tall buildings/ structures are proposed, analogue signals have ceased to be transmitted and have been replaced by digital signals since 2012. As such, the Proposed Development's potential to interfere with television, radio (both analogue and digital) and mobile phone reception is considered negligible.

22.5.11 Therefore, an assessment of the Proposed Development's effect on electronic interference is not considered to be required.

Electro-Magnetic Fields

22.5.12 The existing National Grid Deeside Substation and existing 132 kV substation operated by SPEN, including associated transmission/ distribution lines, are expected to remain operational during construction and operation of the Proposed Development. Any additional or replacement transmission cables within the Electrical Connection Corridor are likely to utilise existing cable routes, and routes within the wider Main Site.

22.5.13 Effects from EMF on the local population, where they relate to human health, will be considered and included in brief within **Chapter 18: Human Health**.

Summary

22.5.14 Therefore, with consideration of NPS EN-5 (Section 2.9), the following potential impacts are proposed to be **scoped out** of the EIA:

- risk to electronic interference in relation to transmission signals during construction of the Proposed Development (relating to cranes);
- risk to electronic interference in relation to transmission signals operation of the Proposed Development (relating to absorber stack height);
- risk of electronic interference to external receptors arising from electrical production during operation of the Proposed Development;
  - with the exception of EMF effects to Human Health (to be considered within **Chapter 18: Human Health**); and
- risk to the Proposed Development from electronic interference.

22.6 Summary of Aspects to be Scoped Out

22.6.1 **Table 22-1** provides a summary of the aspects to be scoped out and how each aspect relates to guidance presented in PINS Advice Note 7.

Table 22-1 Summary of Aspects to be Scoped Out

PINS Advice Note 7 Guidance for Scoping out Aspects and Matters	Shipping and Navigation	Commercial Fisheries	Transboundary Effects	Aviation	Electronic Interference and Electro-Magnetic Fields
1. Is there an impact pathway from the Proposed Development to the aspect/matter?	There is potential for interaction between existing vessel traffic in the River Dee and the Proposed Development works within the Water Connection Corridor. See paragraph 22.1.1 for further detail.	The Proposed Development is located where the Dee Estuary narrows into the River Dee, within tidal influence but not considered to provide significant commercial opportunities. See paragraph 22.2.7 for further detail.	Ireland is the nearest EEA State, located approximately 195 km west of the Proposed Development. The Site itself is located within a Ramsar site, SPA and SAC, all of which are European designated sites, and is located within 2 km of the England/Wales border (not an EEA State boundary). See paragraphs 22.3.1 and 22.3.2 for further detail.	Hawarden Airport is located 6.9 km to the south-east of the Proposed Development and there is potential interaction with aviation traffic. See paragraph 22.4.1 for further detail.	The introduction of new structures of significant height and bulk can cause disruption to the reception of electromagnetic waves. See paragraph 22.5.1 for further detail.
2. Is the aspect/matter sensitive to the impact concerned?	Only a small number of vessels expected to use the part of the estuary where the Proposed Development is located. See paragraphs 22.1.8 and 22.1.9 for further detail.	The Dee Estuary supports relatively stable and profitable shellfish and finfish fisheries. See paragraphs 22.2.2to 22.2.6 for further detail.	The Site is located within a Ramsar site, SPA and SAC, and is located within 2 km of the England/Wales border. See paragraphs 22.3.2 and 22.3.3 for further detail.	The absorber stack is expected to reach 105 m indicative height AGL and is therefore considered an air navigation obstacle. See paragraph 22.4.3 for further detail.	TV reception has been considered as it is likely to be affected. Effects from EMF on the local population will be considered within **Chapter 18: Human Health.** See paragraphs 22.5.1 and 22.5.12 for further detail.
3. Is the impact likely to be on a scale that may result in significant effects to the aspect/matter?	There is limited potential for significant effects to other mariners during construction works within the Water Connection Corridor. See paragraph 22.1.11 for further detail.	No significant effects are anticipated for commercial fisheries as a result of the Proposed Development. See paragraph 22.2.8 for further detail.	Due to the distance to the nearest EEA State, no significant effects are anticipated. Potential effects on relevant qualifying features of European designated	Potential impacts to aviation traffic associated with Hawarden Airport are considered unlikely as a result of the distance of the facility and runway orientation. See	Although new tall buildings / structures are proposed, analogue signals have ceased to be transmitted and have been replaced by digital signals since 2012. As

PINS Advice Note 7 Guidance for Scoping out Aspects and Matters	Shipping and Navigation	Commercial Fisheries	Transboundary Effects	Aviation	Electronic Interference and Electro-Magnetic Fields
			sites will be considered within a HRA report to be submitted with the DCO application. See paragraph 22.3.4 and 22.3.5 for further detail. England and Wales are constituent countries of the United Kingdom and are not considered separate EEA States for the purpose of transboundary effects under the EIA Regulations. The Site is wholly within Wales. Any potential impacts to receptors within England will be considered and included within the assessment as detailed within the respective chapter. See paragraphs 22.3.6 and 22.3.7 for further detail.	paragraph 22.4.5 for further detail.	such, no significant effects on electronic interference are anticipated. Effects from EMF where they relate to human health, will be considered within **Chapter 18: Human Health**. See paragraphs 22.5.9 to 22.5.12 for further detail.
4. Could the impact contribute cumulatively with other impacts to result insignificant effects to the aspect/matter?	There is no potential for cumulative effects.	There is no potential for cumulative effects.	Potential cumulative effects on relevant qualifying features of European designated sites will be considered within a HRA report to be submitted with the DCO application. It is currently anticipated that a Draft	There is no potential for cumulative effects.	There is no potential for cumulative effects.

PINS Advice Note 7 Guidance for Scoping out Aspects and Matters	Shipping and Navigation	Commercial Fisheries	Transboundary Effects	Aviation	Electronic Interference and Electro-Magnetic Fields
			Shadow HRA Report will be provided alongside the PEIR. See paragraph 22.3.5 for further detail.		
5. Is there a method of avoidance or mitigation that would reduce the impact on the aspect/matter to a level where significant effects would not occur?	No significant effects are anticipated, and industry best practice will be implemented as embedded mitigation. See paragraph 22.1.10 for further detail.	No significant effects are anticipated and therefore avoidance or mitigation is not required.	No significant effects are anticipated to EEA States and therefore avoidance or mitigation is not required. Any likely significant effects identified in relation to qualifying features of European designated sites requiring avoidance or additional mitigation will be detailed within the HRA Report to be submitted with the DCO application. See paragraphs 22.3.4 and 22.3.5 for further detail.	No significant effects are anticipated. Aviation warning lighting and charting secured through the draft DCO will suitably mitigate any risk to aviation. Temporary construction cranes may reach up to 170 m AGL, the Applicant will inform the Civil Aviation Authority (CAA) no less than 40 working days in advance of the erection of any such crane. The Applicant will comply with any instructions relating to the management of relevant cranes that may be issued by the CAA. See paragraphs 22.4.4 and 22.4.6 for further detail.	No significant effects are anticipated and therefore avoidance or mitigation is not required. See paragraph 22.5.13 for further detail.
6. Is there sufficient confidence in the avoidance or mitigation method in terms of deliverability and efficacy to support the request?	Yes, see paragraphs 22.1.10 to 22.1.13 for further detail.	Yes, see paragraphs 22.2.7 to 22.2.8 for further detail.	Yes, see paragraphs 22.3.7 to 22.3.8 for further detail.	Yes, see paragraphs 22.4.4 to 22.4.7 for further detail.	Yes, see paragraphs 22.5.7 to 22.5.12 for further detail.

PINS Advice Note 7 Guidance for Scoping out Aspects and Matters	Shipping and Navigation	Commercial Fisheries	Transboundary Effects	Aviation	Electronic Interference and Electro-Magnetic Fields
7. Is there empirical evidence available to support the request?	Yes, see paragraphs 22.1.3 to 22.1.9 for further detail.	Yes, see paragraphs 22.2.1 to 22.2.6 for further detail.	Yes, see paragraphs 22.3.1 to 22.3.3 for further detail.	Yes, see paragraphs 22.4.1 to 22.4.3 for further detail.	Yes, see paragraphs 22.5.1 to 22.5.6 for further detail.
8. Do relevant statutory consultees agree with the request?	The Harbour Authority, Trinity House and any other stakeholders will be contacted if any specific control measures are required. See paragraph 22.1.12 for further detail.	No further consultation is proposed above and beyond the opinions received as part of the Scoping Opinion.	No further consultation is proposed above and beyond the opinions received as part of the Scoping Opinion.	The Civil Aviation Authority will be consulted with. See paragraph 22.4.7 for further detail.	No further consultation is proposed above and beyond the opinions received as part of the Scoping Opinion.
9. Have you had regard to (a) relevant National Policy Statement(s) (NPS) and specifically any requirement stated in the NPS (s) in respect of the assessment of this aspect/matter?	Yes, the assessment has regard for NPS EN-1. See paragraph 22.1.12 for further detail.	Yes, the assessment has regard for NPS EN-1. See paragraph 22.2.9 for further detail.	Yes, the assessment has regard for NPS EN-1. See paragraph 22.3.8 for further detail.	Yes, the assessment has regard for NPS EN-1. See paragraph 22.4.8 for further detail.	Yes, the assessment has regard for NPS EN-5. See paragraph 22.5.14 for further detail.

23. Summary of Potential Significant Effects

23.1 Introduction

23.1.1 This Scoping Report has been prepared on the basis that the Applicant intends to undertake an EIA in respect of the Proposed Development and to produce an ES to report the findings of the EIA. The Scoping Report provides the information required to accompany a request for a Scoping Opinion, in accordance with Regulation 10 of the EIA Regulations.

23.1.2 This report has identified the likely environmental effects that are considered to have the potential to be significant and proposes the approach to be used in assessments that will be undertaken for the EIA to characterise and understand the likely significance of these effects.

23.1.3 For clarity, **Table 23-1** presents a summary of the proposed scope of the technical topics to be included in the ES, i.e. that are scoped in. It also identifies those elements that it is proposed are scoped out of the EIA, on the basis that these would not result in likely significant effects, and the rationale behind this conclusion.

Table 23-1 Summary of the potential significant effects to be considered in the ES

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
Air Quality	Construction	• Fugitive emissions of dust and particulate matter (human health and relevant ecological receptors within the screening distance). • Construction traffic on affected road network (human health and relevant ecological receptors within the screening distance).		
	Operation	• Emissions to air from the Proposed Development (human health and relevant ecological receptors within the study area).	• Operational road traffic (human health and relevant ecological receptors within the screening distance)	• The increase in operational traffic is less than recognized screening criteria and is therefore proposed to be scoped out.
	Decommissioning	• Fugitive emissions of dust and particulate matter (human health and relevant ecological receptors within the screening distance). • Decommissioning traffic (human health and relevant ecological receptors within the screening distance).		
Noise and Vibration	Construction	• Noise Emissions • Vibration emissions. • Construction traffic noise.	• Construction noise and vibration from existing project elements (i.e. Existing Natural Gas Corridor and Repurposes CO_2 Connection Corridor).	• No construction works are required for existing project elements.
	Operational	• Plant noise emissions.	• Operational traffic noise. • Plant vibration emissions. • Operational noise and vibration from existing project elements.	• Forecast operational traffic flows of 132 two-way light vehicle movements and 14 two-way HGV movements are not sufficient enough to result in a material change in road traffic noise levels.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
				• No sources of operational vibration that would be perceptible at sensitive receptors would be introduced. • There would be no change to the ambient noise environment from existing project elements.
	Decommissioning		• Noise emissions. • Vibration emissions. • Decommissioning traffic noise.	• Noise effects during the decommissioning phase of the Proposed Development will be similar or less than noise effects during the construction phase.
Traffic and Transport	Construction	• The construction phase will give rise to an increase in HGV (for deliveries) and light vehicle (construction staff) movements on the highway network. • Impacts on designated sites and habitats through permanent loss and temporary landtake, including the Dee Estuary SPA, Ramsar, SAC and SSSI and priority habitats including saltmarsh and OMH. • Direct mortality and/or injury of protected and notable species (including, birds, reptiles, bats, badger, riparian mammals, great crested newts, aquatic species, fish, terrestrial invertebrates and potentially natterjack toads).		
	Operation		• Operational Traffic Assessment	• The scale of potential traffic proposed is not considered to require an assessment of the operational phase within the ES Chapter i.e. up to circa 66

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
				permanent roles created once Trains 1 and 2 are operating .
	Decommissioning		• Decommissioning Traffic Assessment	• It is not proposed to undertake any assessment of the decommissioning phase due to the 30 year lifecycle of the Proposed Development, and the uncertainties over accurately predicting the baseline conditions across that length of time., with any impact confirmed likely to be similar to that assessed at the construction phase.
Terrestrial and Aquatic Ecology	Construction	• Impacts on designated sites and habitats through permanent loss and temporary landtake, including the Dee Estuary SPA, Ramsar, SAC and SSSI and priority habitats including saltmarsh and OMH. • Direct mortality and/or injury of protected and notable species (including, birds, reptiles, bats, badger, riparian mammals, great crested newts, aquatic species, fish, terrestrial invertebrates and potentially natterjack toads). • Disturbance and degradation on ecological features (designated sites, habitats and species), from changes in water quality, noise and vibration, dust, visual, and lighting. • Opportunities for biodiversity mitigation and enhancement within the Indicative Enhancement Area.	• Impacts on hazel dormouse (to be confirmed).	• Lack of suitable habitat for dormouse.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
	Operation	• Disturbance of ecological features (as identified during construction) during operation, from changes in water quality, air quality and deposition, noise, visual and lighting. • Risk of mortality related to entrainment and impingement, and/or disruption to migration routes by the abstraction of water.		
	Decommissioning	• Disturbance to ecological features is assumed to be similar to construction.		
Marine Ecology	Construction	• Direct loss and physical disturbance to relevant benthic habitats and species from works carried out below MHWS within the Water Connection Corridor section of the Site. • Physical disturbance to marine ecology from increased suspended sediment concentrations (i.e. increased turbidity and deposition) within the ZoI. • Indirect effects to marine ecology from changes in marine water quality (excluding turbidity) within the ZoI. • Underwater sound and vibration disturbance to marine ecology within the ZoI. • Indirect effects to marine ecology from hydromorphological changes (e.g., changes to water flow or sediment movement) within the ZoI. • Introduction and spread of INNS during any in-river works.	• Physical disturbance to marine ecology from changes in the airborne soundscape and visual disturbance during construction within the ZoI.	• River and land-based construction activities associated with the Proposed Development will create airborne sound and changes in visual cues which has the potential to disturb seals that have surfaced or have hauled out. However, the nearest haul out site for seals is Hilbre Island in the mouth of the Dee Estuary over 15 km downstream of the Proposed Development. • Due to the intervening distance, there will be no available pathway and therefore no likely significant effect to seals and/or other marine mammals from changes in the airborne soundscape and visual disturbance is proposed to be scoped out from further assessment.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Collisions between project vessels and marine mammals. • Indirect effects on commercial fish and shellfish species.		
	Operation	• Indirect effects to marine ecology from any changes to existing thermal and chemical effects from treated water discharge (subject to control under an Environmental Permit that will be required for discharges). • Indirect effects to marine ecology from hydromorphological changes (e.g., changes to water flow or sediment movement) within the ZoI. • Physical disturbance and potential mortality to marine ecology from entrainment and impingement within the cooling water abstraction and discharge infrastructure within the Water Connection Corridor. • Temporary increase in SSC from potential maintenance dredging leading to contaminant mobilisation turbidity and smothering effects on subtidal habitats and species. • Effects to intertidal habitats and species (including fish) from the deposition of airborne pollutants (e.g., from emissions from the power plant stacks during operation). • Changes in the airborne soundscape during operation.	• Physical disturbance to marine ecology from changes in the underwater sound, and visual disturbance during operation.	• The operational phase of the Proposed Development will not result in changes to underwater sound, or visual disturbance which will impact marine habitats or species.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
	Decommissioning	• Potential impacts to marine ecology receptors during the decommissioning phase are assumed to be similar to the construction phase.		
Water Environment and Flood Risk	Construction – Surface Water	• Potential temporary impacts on water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site run-off. • Potential temporary impacts on water levels and sediment dynamics. • Potential impacts on any water abstractions (if confirmed any are present). • Potential morphological impacts to freshwater features where they may be crossed using intrusive techniques (if present). • Water quality impacts on receiving watercourses from an increase in foul drainage from the Proposed Development. • Potential impact upon receiving watercourses as a result of hydrostatic testing of the Proposed CO_2 Connection Corridor.		
	Construction – Flood Risk	• Potential impacts to water conveyance where proposed construction cross watercourses during construction (above and below ground).		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Encroachment within Zones C1 and Zone B (including potentially the functional floodplain) could lead to the displacement of tidal and fluvial floodwater during construction (above ground). • Potential changes to existing surface water (pluvial) flows during construction phase. • Potential impacts of future flooding from all sources to and from the Proposed Development, including (but not limited to) a potential risk to construction workers during the construction phase, due to risk of fluvial/tidal and reservoir flooding. • Increase in volume and rate of surface water runoff from new impervious areas including compacted ground on the Main Site leading to an impact on flood risk. • Loss of floodplain volume due to encroachment on the floodplain. • High groundwater levels will need to be managed for flood risk during foundation/ deep excavation. • Siltation and blockages within the drainage systems causing failure or improper function, which could impact hydrology through flooding.		
	Construction - Groundwater	• Leakage and spills from fuels, oils, chemicals, and concrete may results from groundwater and soil contamination during construction		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		phase which also indirectly affects the watercourses via site run-off or directly affects the water bodies in the vicinity of the Site. • Required dewatering during construction and excavation phase may potentially impact the groundwater quality, flow and levels from groundwater abstraction and associated discharges. • Excavation and sub-surface structures could also impact the groundwater quality and in turn the watercourses within or near the Site.		
	Operation – Surface Water	• Water quality impacts to the Dee Estuary and other surface water features that may receive surface water runoff, cooling water or treated effluent discharges from the Proposed Development. • Entry of contaminated runoff into the Dee Estuary as a result of chemical spills (e.g. from the chemical storage area or fire water if needed etc.) and subsequent water quality impacts. • Hydromorphological impacts to freshwater features, including changes to physical form (for example scour or culverting), hydraulic processes and sediment dynamics (for example constriction of flows, flood plain disconnection), which together underpin habitats in watercourses and their floodplains.		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Impacts on surface water abstractions (if identified). • Impact on water resources for other users and on protected habitats and species will be considered where relevant.		
	Operation – Flood Risk	• Potential impacts to surface water conveyance during operation (above ground). • Encroachment within Zones C1 and Zone B (including potentially the functional floodplain) could lead to the displacement of tidal and fluvial floodwater during operation (above ground). • Potential changes to existing surface water (pluvial) flows. • Potential impacts of future flooding from all sources to and from the Proposed Development, due to risk of fluvial/tidal and reservoir flooding. • Potential increase in volume and rate of surface water runoff from new impervious areas on the proposed Main Site leading to an impact on flood risk and scour risk in receiving watercourses upstream and downstream. • During a fluvial event, flood paths and levels could be altered and there could be an increased flood risk to the surrounding area. As such, flood compensation could also be required.		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Potential for flood paths and levels to be altered and increased flood risk to the surrounding area should a breach of the tidal flood defences occur (residual flood risk). • Increased surface water runoff from new impermeable areas could result in higher flow if runoff is not appropriately attenuated. This, in turn, could increase flood risk in the area.		
	Operation – Groundwater	• The foundation and subsurface structures may impede or alter the groundwater flow regime which may result in groundwater mounding up the hydraulic gradient and reduced groundwater levels down hydraulic gradient. • Groundwater abstraction during operational phase may have a potential impact on groundwater resources. • Potential impact on groundwater resources should an alternative water supply be required (i.e. groundwater abstraction). At present, water supply is anticipated to be sourced from mains water supply and the River Dee. • Contaminants may migrate to non-contaminated soils, geology, and groundwater via the foundations of structures.		
	Decommissioning – Surface Water, Flood Risk and Groundwater	• Potential impacts to water environment and flood receptors during the decommissioning phase are assumed to be similar to the construction phase.		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
Geology and Ground Conditions	Construction	• Damage, disturbance or removal of geological features of interest RIGS, LGS and GCR sites. Note that although none have been identified within the Site and study area on Data Map Wales, stakeholder correspondence will be required to confirm their absence prior to scoping out. • Temporary compaction and degradation of soils. • Removal of soils from agricultural production. • Temporary mineral severance or sterilization. • Potential reduction of flow to surface water bodies and change in hydrogeological and hydrological setting locally. • Mobilisation and migration of contamination to unsaturated soils, groundwater and surface watercourses. • Potential impacts on groundwater as a pathway may be created for drilling fluids or other fluids to reach sensitive groundwater receptors. • Potential for contaminants in unsaturated soils to be exposed to surface water run-off and to leach to groundwater in open excavations. • Potential impacts from migration of contaminants from uncovered stockpiles to surface water and groundwater receptors.	• The areas of the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor.	• No construction or maintenance works are anticipated to be required to the existing pipelines excluding minor maintenance/upgrade works to be carried out from AGIs.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Creation of preferential pathways for the migration of soil contamination and gases. • Migration of contamination to unsaturated soils, surface water and groundwater. • Potential impacts on groundwater from construction of underground structures/ piling. • Impacts from potential contamination in dust and fine particulate matter may impact ecological receptors. • Impacts on human health from contamination within unsaturated soil (dust and fine particulate matter) and groundwater. • The disturbance or mobilisation of existing contamination towards buildings or service pipelines within or outside of the Site may result in damage or deterioration and potential permeation of drinking water pipes by contaminants, due to aggressive conditions caused by the contaminants present or through the introduction of fill materials (lowering pH). • Any contamination removed, remediated, or mitigated leading to removal of contaminant sources from the source – pathway – receptor linkage (may result in potential beneficial impacts on human health, controlled waters, property receptors and ecological receptors).		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
	Operation	• Permanent damage, disturbance or removal of geological features of interest (RIGS/ LGS and GCR). • Permanent compaction and degradation of soils. • Permanent mineral severance or sterilization.	• Adverse impacts on human health from contamination within shallow unsaturated soil and groundwater. • Adverse impacts on unsaturated soil and groundwater deriving from pollution events bypassing the drainage system.	• Impacts to human health and controlled waters caused by land contamination are considered unlikely as maintenance and operation of the Proposed Development will be in accordance with environmental legislation and good practice.
	Decommissioning	• Potential impacts to geology and ground condition receptors during the decommissioning phase are assumed to be similar to the construction phase.		
Landscape and Visual Amenity	Construction	• Loss of landscape elements and/or change in landscape/ seascape character as a result of introduction of construction activity. • Change in visual amenity as a result of views of construction activity, vehicles and tall machinery including cranes.	• Night-time lighting	• Any lighting during the construction phase will be directional and temporary, and designed to minimise potential for light spillage beyond the Site, particularly towards houses, live traffic and ecological habitats in so far as it is reasonably practicable. • Given the existing high levels of lighting in the area, being industrial in nature, significant effects on sensitive receptors is considered unlikely and is therefore proposed to be scoped out of the assessment. • An Indicative Lighting Strategy will be prepared and submitted as part of the DCO Application. This will then inform the preparation of an external lighting scheme under a DCO requirement which will be

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
				designed in accordance with relevant standards.
	Operation	• Change in landscape/ seascape character as a result of the Proposed Development. • Change in visual amenity as a result of views of the Proposed Development. • The impact of night-time light pollution at operation will be considered.		
	Decommissioning	• Loss of landscape elements and/or change in landscape/ seascape character as a result of introduction of decommissioning activity. • Loss of landscape elements and/or change in landscape/ seascape character as a result of the potential removal of elements within the Proposed Development. • Change in visual amenity as a result of views of decommissioning activity, vehicles and tall machinery including cranes. • Change in visual amenity as a result of the potential removal of elements within the Proposed Development.		• Any lighting during the decommissioning phase will be directional and temporary, and designed to minimise potential for light spillage beyond the Site, particularly towards houses, live traffic and ecological habitats in so far as it is reasonably practicable. • Given the existing high levels of lighting in the area, being industrial in nature, significant effects on sensitive receptors is considered unlikely.
Physical Processes	Construction	• Temporary suspended sediment disturbance and contaminant dispersion.	• Localised disturbance to the bed morphology caused by the cofferdam and temporary structures.	• The morphology of the seabed/ riverbed can be expected to rapidly recover to a stable condition after removal of the temporary cofferdam structures.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
	Operation	• Increased thermal discharge, if the thermal load from the cooling water is greater than the current arrangement. • Temporary suspended sediment disturbance and contaminant dispersion.	• Scouring due to the presence of the new outfall structures affecting local flows and seabed levels. • The Water Connection Corridor will discharge and abstract water from the River Dee and could disrupt the movement of water and sediment through the channel. During the discharge from the corridor, the seabed levels could be impacted if there was a significant volume of water discharging.	• This has been scoped out since any effect will be highly localised and occur over a relatively short timescale (i.e. a few tides) before stabilizing and would be no different to operational effects due to the existing outfall. • The discharge and abstraction are due to take place only during high tide and during a maximum time period of three hours. The potential effect on the flow of water and sediment will be negligible due to controlled release and abstraction. • The discharge is controlled and is only released within a three-hour period around high tide on the ebb phase. There will therefore be limited interaction between the discharged water and the bed.
	Decommissioning	• Temporary suspended sediment disturbance and contaminant dispersion.	• Localised disturbance to the bed morphology caused by the cofferdam and temporary structures.	• The morphology of the seabed can be expected to rapidly recover to a stable condition after removal of the temporary cofferdam structures.
Cultural Heritage	Construction (terrestrial)	• Designated historic assets within 1 km and high value designated assets within 5 km; non-designated built heritage within 1 km of the Site. • Archaeological remains and deposits, including peat and other paleoenvironmental deposits, within 1 km of the Site.		
	Operation (terrestrial)	• Designated historic assets within 1 km and high value designated assets	• Buried archaeology.	• There is not expected to be any potential impacts to buried

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		within 5 km, non-designated built heritage within 1 km. Historic Landscape within 1 km.		archaeology during the operational phase of the Proposed Development as any impacts will have occurred during the construction phase. Archaeology has therefore been scoped out of the assessment at the operation phase.
	Decommissioning (terrestrial)	• Designated historic assets within 1 km and high value designated assets within 5 km, non-designated built heritage within 1 km. Historic Landscape within 1 km.	• Buried archaeology.	• There is not expected to be any potential impacts to buried archaeology during the decommissioning phase of the Proposed Development as any impacts will have occurred and been mitigated during the construction phase. Archaeology has therefore been scoped out of the assessment at the decommissioning phase.
	Construction (marine)	Direct impacts on known and potential marine cultural heritage receptors on previously undisturbed sediment as a result of construction.	• Direct impacts on known and potential marine cultural heritage receptors on previously disturbed sediment as a result of construction. • Indirect impacts to marine heritage receptors due to altered sediment or hydrological processes.	• Impact of construction activities will be on mobile intertidal sediments which have been disturbed by installation of the original outflow. Similarly, impacts from construction vessel movements are considered to be localised and temporary, and the magnitude of change is assessed as negligible, as no known maritime heritage has been identified within the Site. • As a result of the assessment of changes to hydrodynamics and sedimentary processes which predicts a low/negligible exposure to change (**Chapter 14: Physical Processes**) the magnitude of indirect impacts to marine cultural

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
				heritage receptors during the construction phase is expected to be negligible.
	Operation (marine)		• Direct impacts on known and potential marine cultural heritage receptors and deposits of archaeological importance as a result of operational activities and maintenance dredging. • Indirect impacts to known and potential marine cultural heritage receptors due to altered sediment or hydrological processes.	• As maintenance dredging, if required, will take place in areas where the dredging impact has already occurred, there is unlikely to be further impact. • As a result of the assessment of changes to hydrodynamics and sedimentary processes which predicts a low/negligible exposure to change (**Chapter 14: Physical Processes**) the magnitude of indirect impacts to marine cultural heritage receptors during the operation phase is expected to be negligible.
	Decommissioning (marine)			• There is not expected to be any potential impacts to buried marine archaeology during the decommissioning phase of the Proposed Development as any impacts will have occurred and been mitigated during the construction phase. Archaeology has therefore been scoped out of the assessment at the decommissioning stage.
Socio-Economics	Construction	• Temporary direct and indirect employment; promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits.		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Temporary or permanent disruption to traffic on the local and strategic road networks. • Impacts on businesses either direct (demolition/ land take) or indirect via in combination effects identified by other discipline assessments. • Land use impacts (such as effect on planned or proposed developments).		
	Operation	• Permanent direct and indirect employment creation; the potential for the promotion/ provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits. • Permanent disruption to PRoW. • Permanent impacts on businesses, either direct (land take) or indirect via in combination effects identified by other discipline assessments. • Permanent land use impacts (such as on planned or proposed developments).	Permanent disruption to traffic on the local and strategic road networks.	Table 8-5 of the Traffic and Transport Chapter scopes out operational traffic effects.
	Decommissioning	Potential impacts to socio-economic receptors during the decommissioning phase are assumed to be similar to the construction phase.		
Climate Change	Construction	• GHG Assessment, including: – Demolition: – On-site deconstruction activity i.e., demolition and		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out

dismantling of existing structures and buildings.
  - Transportation and disposal of dismantled equipment, earthworks, and disposal of waste.
  - Land clearance.
- Product Manufacture:
  - Raw material extraction and manufacturing of products/ materials associated with the Proposed Development.
  - Transport of products/ materials to the Proposed Development associated with the Proposed Development.
- Construction:
  - On-site construction activity associated with the modification of the Proposed Development.
  - Transport of construction workers associated with the modification of the Proposed Development.
  - Transportation and disposal of earthworks/ waste associated with the Proposed Development.

- CCR Assessment, including:
  - Extreme weather events;
  - Flood risk;
  - SLR;
  - Wild fires;

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		– Droughts; – Temperature change; and – Precipitation. • ICCI Assessment, including: – Extreme weather events; – SLR; – Temperature; – Precipitation; and – Wind.		
	Operation	• GHG Assessment, including: – Operation of the Proposed Development under continuous monitoring and surveillance. – Transportation and disposal of waste from the Proposed Development. – Proposed Development Building and grounds maintenance. – Emissions displacement from the Proposed Development. – Landscaping. • CCR Assessment, including: – Extreme weather events; – Flood risk; – SLR; – Wild fires; – Droughts; – Temperature change; and – Precipitation. • ICCI Assessment, including: – Extreme weather events; – SLR;		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		– Temperature; – Precipitation; and – Wind.		
	Decommissioning	• GHG Assessment, including: – On-site deconstruction activity i.e., demolition of existing plant and equipment, existing waste management facilities etc. – Transportation, waste processing and disposal of dismantled equipment, earthworks and disposal of waste. – Land clearance. – Qualitative GHG Assessment will be undertaken for the decommissioning phase. • CCR Assessment, including: – Extreme weather events; – Flood risk; – SLR; – Wild fires; – Droughts; – Temperature change; and – Precipitation. • ICCI Assessment, including: – Extreme weather events; – SLR; – Temperature; – Precipitation; and – Wind.		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
Human Health	Construction	• Access to healthcare and other social infrastructure services, both in terms of potential increases in road traffic and increase in workforce population. • Employment and income and education and training opportunities, including provision of economic opportunities and resources that protect and promote good health. • Human health impacts associated with air quality, noise and vibration, flood risk, and surface water impacts. • Access to open space, PRoW, recreational facilities and opportunities for physical activity and active travel. • Climate change – greenhouse gas emissions.		
	Operation	• Access to healthcare and other social infrastructure services, both in terms of potential increases in road traffic and increase in workforce population. • Employment and income and education and training opportunities, including provision of economic opportunities and resources that protect and promote good health. • Human health impacts associated with air quality, noise and vibration, flood risk, and surface water impacts. • Access to open space, PRoW, recreational facilities and opportunities for physical activity and active travel.		

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
		• Climate change – greenhouse gas emissions. • Radiation – potential exposure to EMFs.		
	Decommissioning	• Access to healthcare and other social infrastructure services, both in terms of potential increases in road traffic and increase in workforce population. • Employment and income and education and training opportunities, including provision of economic opportunities and resources that protect and promote good health. • Human health impacts associated with air quality, noise and vibration, flood risk, and surface water impacts. • Access to open space, PRoW, recreational facilities and opportunities for physical activity and active travel. • Climate change – greenhouse gas emissions		
Major Accidents and Disasters	Construction	• Construction Hazards.	• Other Industrial Hazards • Meteorological Hazards • Hydrological Hazards • Geophysical Hazards • Other Natural Hazards • Societal Hazards	• Due to the shorter duration of the construction phase and smaller chemical inventory compared to the operational phase the likelihood of a MA&D of these types occurring is much lower.
	Commissioning	• Commissioning Hazards	• Other Industrial Hazards • Meteorological Hazards • Hydrological Hazards • Geophysical Hazards	Due to the short duration of the commissioning phase compared to the operational phase the likelihood of a MA&D of these types occurring is much lower.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
			• Other Natural Hazards Societal Hazards	
	Operation	• Potential for various hazards, including: – Operational Hazards; – Other Industrial Hazards; – Meteorological Hazards; – Hydrological Hazards; – Geophysical Hazards; – Other Natural Hazards; and – Societal Hazards.		
	Decommissioning		• Decommissioning Hazards	• It is likely that sufficient information will not be available to inform an assessment of decommissioning hazards. Hazards will be controlled via a DEMP produced and agreed with NRW as part of the Environmental Permit surrender.
Materials and Waste	Construction	• Changes in availability of materials. • Changes in available landfill void capacity.	• Changes to allocated/safeguarded mineral site. • Changes to allocated/safeguarded waste site. • Changes to MSAs	• There are no allocated/safeguarded mineral or waste sites present within the Site Boundary. • MSAs are not considered in the materials and waste assessment.
	Operation	• Changes in available landfill void capacity. • Changes in available hazardous waste management facility capacity.	• Waste arising from extraction, processing and manufacture of construction components and products. • Other environmental impacts associated with the management of waste from the Proposed Development	• This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
			e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste. • Changes in availability of materials. • Changes to allocated/safeguarded mineral site. • Changes to allocated/safeguarded waste site. • Changes to MSAs.	outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured. • Other environmental impacts associated with the management of waste are addressed separately in other relevant chapters. • Forecast effects are (using professional judgement) considered negligible in relation to the scale and nature of the Proposed Development. • There are no allocated/safeguarded mineral or waste sites present within the Site Boundary. • MSAs are not considered in the materials and waste assessment.
	Decommissioning		• Waste arising from extraction, processing and manufacture of construction components and products. • Other environmental impacts associated with the management of materials and waste to or from the Proposed Development e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site	• This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.

Technical Topic	Development Stage	Potential Significant Effect Scoped into the ES Assessment	Scoped Out	Rationale for Scoping Out
			transport of materials and waste. • Changes in availability of materials. • Changes in available landfill capacity. • Changes to allocated/safeguarded mineral site. • Changes to allocated/safeguarded waste site. • Changes to MSAs.	• Other environmental impacts associated with the management of materials and waste are addressed separately in other relevant chapters. • The Proposed Development has a long design life and as such it is not considered practicable to reliably forecast decommissioning requirements and infrastructure far in the future. • There are no allocated/safeguarded mineral or waste sites present within the Site Boundary. • MSAs are not considered in the materials and waste assessment.
Cumulative Effects	Construction	• Cumulative and combined effects as a result of construction of the Proposed Development.		
	Operation	• Cumulative and combined effects as a result of operation of the Proposed Development.		
	Decommissioning		• Cumulative effects as a result of decommissioining	• Them operating life of the Proposed Development is assumed to be 30 years, and therefore, sufficient information on planned projects and developments is not yet available to inform a cumulative assessment of decommissioning impacts.

24. Glossary

Abbreviation	Description
ADI	Automatic Identification System
AEZ	Archaeological Exclusion Zones
AGI	Above Ground Installation
AGL	Above ground level
AIL	Abnormal Indivisible Loads
AIS	Automatic Identification System
ALC	Agricultural Land Classification
ANC	Acoustics and Noise Consultants
AOD	Above Ordnance Datum
APFP	Applications: Prescribed Forms and Procedure
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
AQMAU	Air Quality Modelling and Assessment Unit
ATC	Automatic Traffic Count
BAT	Best Available Techniques
BAT-AELs	BAT-Associated Emission Levels
BEIS	Business, Energy and Industrial Strategy
bgl	Below ground level
BGS	British Geological Survey
BMV	Best and Most Versatile Land
BNG	Biodiversity Net Gain
BRef	Best Available Techniques Reference Document
BRES	Business Register and Employment Survey
BS	British Standard
CAA	Civil Aviation Authority
CCC	The Committee on Climate Change
CCGT	Combined Cycle Gas Turbine
CCM	Carboniferous Coal Measures
CCP	Carbon Capture Plant
CCR	Carbon Capture Readiness
CCRA	Climate change resilience assessment
CCS	Carbon Capture and Storage
CCUS	Carbon Capture Utilisation and Storage
CD	Chart Datum

Abbreviation	Description
CDM	Construction Design and Management
CDOIF	Chemicals and Downstream Oil Industries Forum
CEC	Cranfield Environment Centre
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEMP	Construction Environmental Management Plan
CERC	Cambridge Environmental Research Consultants
CGS	Clean Growth Strategy
CH_4	Methane
CHP	Combined Heat and Power
CIBSE	Chartered Institution of Building Services Engineers
CIEEM	Chartered Institute for Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CLP	Classification Labelling and Packaging
CNP	Critical National Priority
CO	Carbon monoxide
CO_2	Carbon Dioxide
COMAH	Control of Major Accident Hazard
COPA	Control of Pollution Act
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
DAM	Development Advice Map
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DEMP	Decommissioning Environmental Management Plan
DESNZ	Department for Energy Security and Net Zero
DML	Deemed Marine Licence
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
DoWCoP	Definition of Waste: Development Industry Code of Practice
EC	European Commission
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EMS	Environmental Management Systems
EPR	Environmental Permitting Regulations

Abbreviation	Description
EQS	Environmental Quality Standards
ES	Environmental Statement
ESNZ	Energy Security and Net Zero (Department of)
EU	European Union
EUNIS	European Nature Information System
EWP	Energy White Paper
FCA	Flood Consequences Assessment
FCC	Flintshire County Council
FEH	Flood Estimate Handbook
FMP	Flood Map for Planning
GCR	Geological Conservation Review
GHG	Greenhouse Gas
GVA	Gross Value Added
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HAT	Highest Astronomical Tide
HDV	Heavy Duty Vehicle
HER	Historic Environment Record
HFC	Hydrofluorocarbons
HGV	Heavy Goods Vehicle
HM	His Majesty's
HMSO	His Majesty's Stationery Office / The Stationery Office
HOPI	Habitats of Principal Importance
HRA	Habitats Regulations Assessment
HRSG	Heat Recovery Steam Generator
HSE	Health and Safety Executive
HV	High Voltage
IAMMWG	Inter-Agency Marine Mammal Working Group
IAQM	The Institute of Air Quality Management
ICCI	In-combination climate change impact
ICES	International Council for the Exploration of the Sea
IED	Industrial Emissions Directive
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organisation
INNS	Invasive non-native species
ISO	International Standards Organisation
JNCC	Joint Nature Conservation Committee
JUB	Jack Up Barge

Abbreviation	Description
km	Kilometre
kV	Kilovolt
LandIS	Land Information System
LCP	Large Combustion Plants
LCRM	Land Contamination Risk Management
LDP	Local Development Plan
LDV	Light Duty Vehicle
LGS	Local Geological Sites
LGV	Light Goods Vehicle
LHA	Local Highway Authority
LNG	Liquified Natural Gas
LNR	Local Nature Reserve
LSOAs	Lower Super Output Areas
LWS	Local Wildlife Site
m	metre
MA&DS	Major Accidents and Disasters
MAFF	Ministry of Agriculture, Food and Fisheries
MAGIC	Multi Agency Geographic Information for the Countryside
MarLIN	Marine Life Information Network
MCAA	Marine and Coastal Access Act
MCZ	Marine Conservation Zone
MEA	Monoethanolamine
MHWN	Mean High Water Neaps
MHWS	Mean High Water Springs
MiPA	Minerals Planning Authorities
MMO	Marine Management Organisation
MMP	Materials Management Plan
MNCR	Marine Nature Conservation Review
MPA	Minerals Products Association
MPS	Marine Policy Statement
MSA	Mineral Safeguarding Area
MU	Management Units
MW	Megawatt
N_2O	Nitrous oxide
NAVTEX	Radio Navigation Warnings Navigational Telex
NBB	Net Biodiversity Benefit
NCN	National Cycle Network
NDMA	N-nitrosodimethylamine

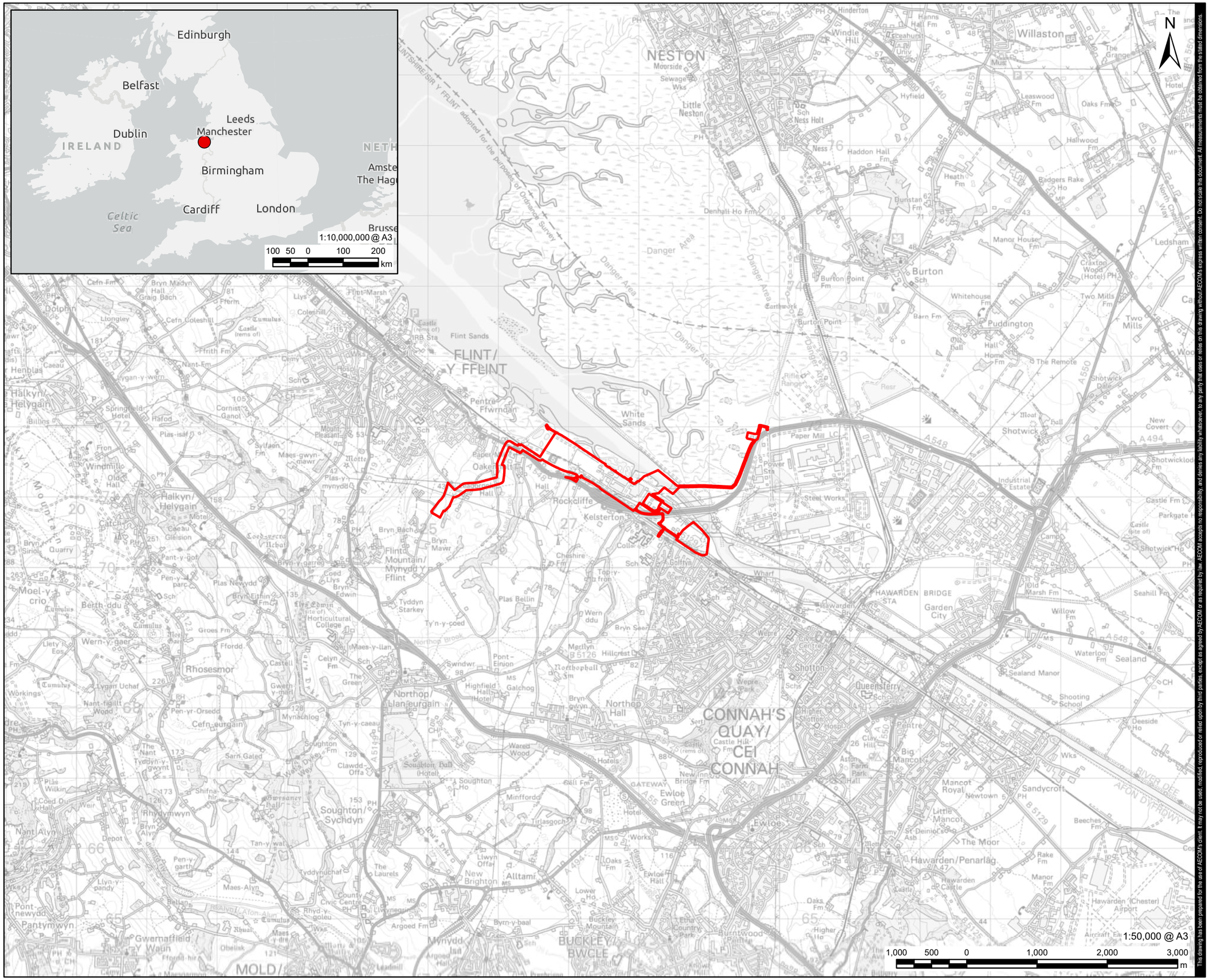
Abbreviation	Description
NERC	Natural Environment and Rural Communities
NF_3	Nitrogen Trifluoride
NG	National Grid
NH_3	Ammonia
NHBC	National House Building Council
NHLE	National Heritage List for England
NIP	National Infrastructure Plan
NM	Nautical Mile
NNR	National Nature Reserve
NO_2	Nitogen Dioxide
NOx	Oxides of Nitrogen
NP	National Plan
NPS	National Policy Statement
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
NtM	Notices to Mariners
NTS	National Transmission System
NVZ	Nitrate Vulnerable Zone
NWIFCA	North Western Inshore Fisheries and Conservation Authority
OMH	Open Mosaic Habitat
ONS	Office for National Statistics
OS	Ordnance Survey
PAD	Protocol for Archaeological Discoveries
P-CCC	Post-Combustion Carbon Capture
PEIR	Preliminary Environmental Information Report
PFA	Pulverised Fuel Ash
PFCS	Perfluorocarbons (PFCs)
PHW	Public Health Wales
PIC	Personal Injury Collision
PINS	Planning Inspectorate
PLCMF	Pennine Lower Coal Measures Formation
PPW	Planning Policy Wales
PRoW	Public Right of Way
PRS	Pressure Reduction Station
PrWS	Private Water Supply
PSR	Pipelines Safety Regulations
RAF	Royal Air Force
RBMP	River Basin Management Plan

Abbreviation	Description
RCAHMW	Royal Commission on Ancient and Historical Monuments in Wales
RIGS	Regionally Important Geodiversity Sites
RSBP	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCANS	Small Cetacean Abundance in the European Atlantic and North Sea
SCOS	Special Committee on Seals
SCR	Selective Catalytic Reduction
SF_6	Sulphur hexafluoride
SHA	Statutory Harbour Area
SMP	Shoreline Management Plan
SMRU	Sea Mammal Research Unit
SNCI	Sites of Nature Conservation Importance
SOPI	Species of Principal Importance
SoS	Secretary of State
SPA	Special Protection Area
SPEN	Scottish Power Energy Networks
SPM	Suspended Particulate Matter
SPZ	Source Protection Zone
SRN	Strategic Road Network
SSC	Suspended sediment concentrations
SSSI	Site of Special Scientific Interest
SuDs	Sustainable Drainage System
SWMP	Site Waste Management Plan
T&S	Transport and Storage
TA	Transport Assessment
TAN	Technical Advice Note
tCO_2e	tonnes of carbon dioxide equivalent
TCPA	Town and Country Planning Act
UK	United Kingdom
UKHO	UK Hydrographic Office
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WaFD	Waste Framework Directive
WBCSD	World Business Council for Sustainable Development
WFD	Water Framework Directive
WNMP	Welsh National Marine Plan

Abbreviation	Description
WPA	Waste Planning Authorities
WRAP	Waste and Resources Action Programme
WRI	World Resources Institute
ZoI	Zone of Influence

Appendix A Figures

Revision: 0 Drawn: JG Checked: AB Approved: FH Date: 2024-01-30



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LEGEND

Indicative Site Boundary

NOTES

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PROJECT NUMBER

60717119

FIGURE TITLE

Site Location Plan

FIGURE NUMBER

Figure 1-1

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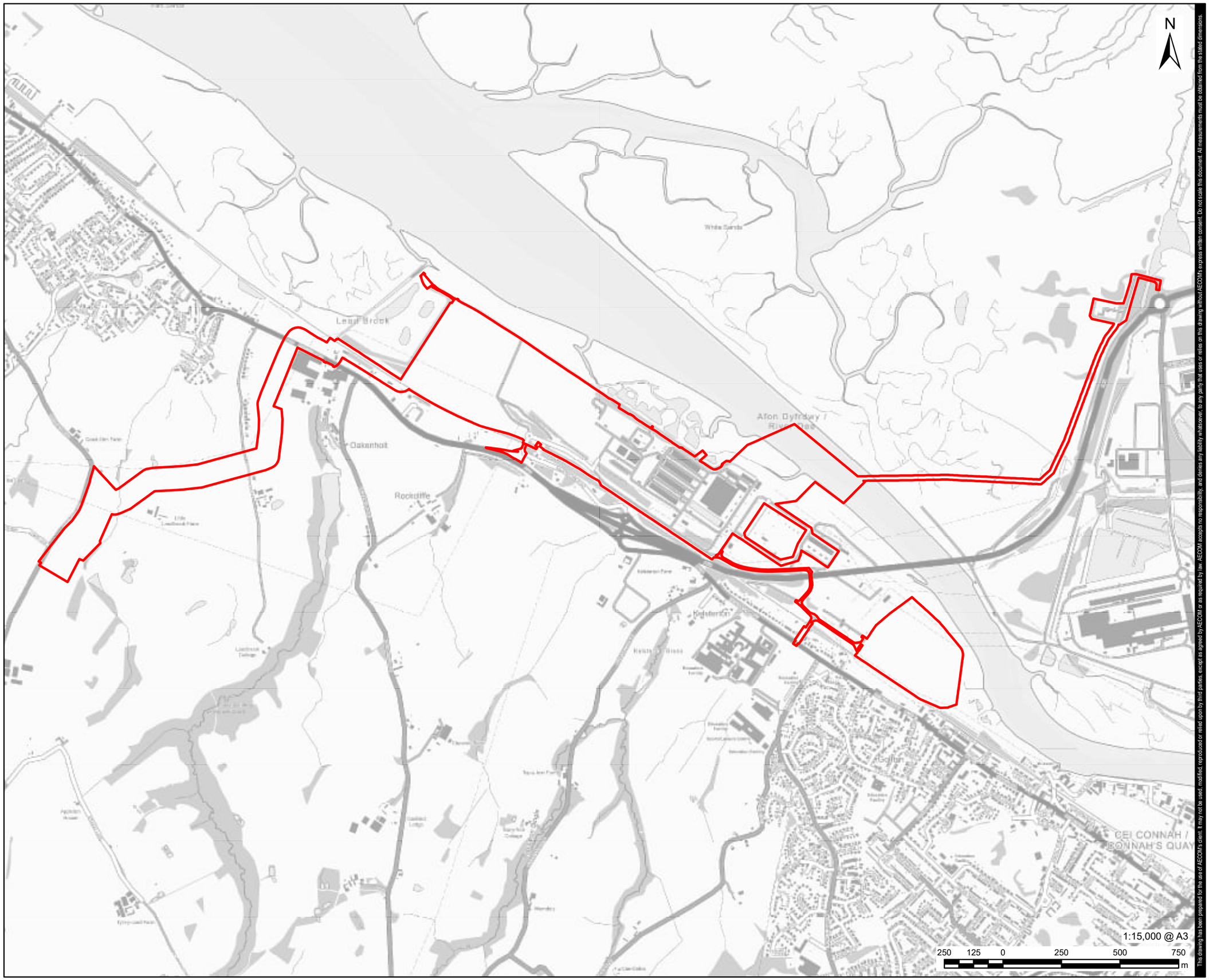

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LEGEND

Indicative Site Boundary

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FIGURE TITLE

Indicative DCO Site

FIGURE NUMBER

Figure 1-2

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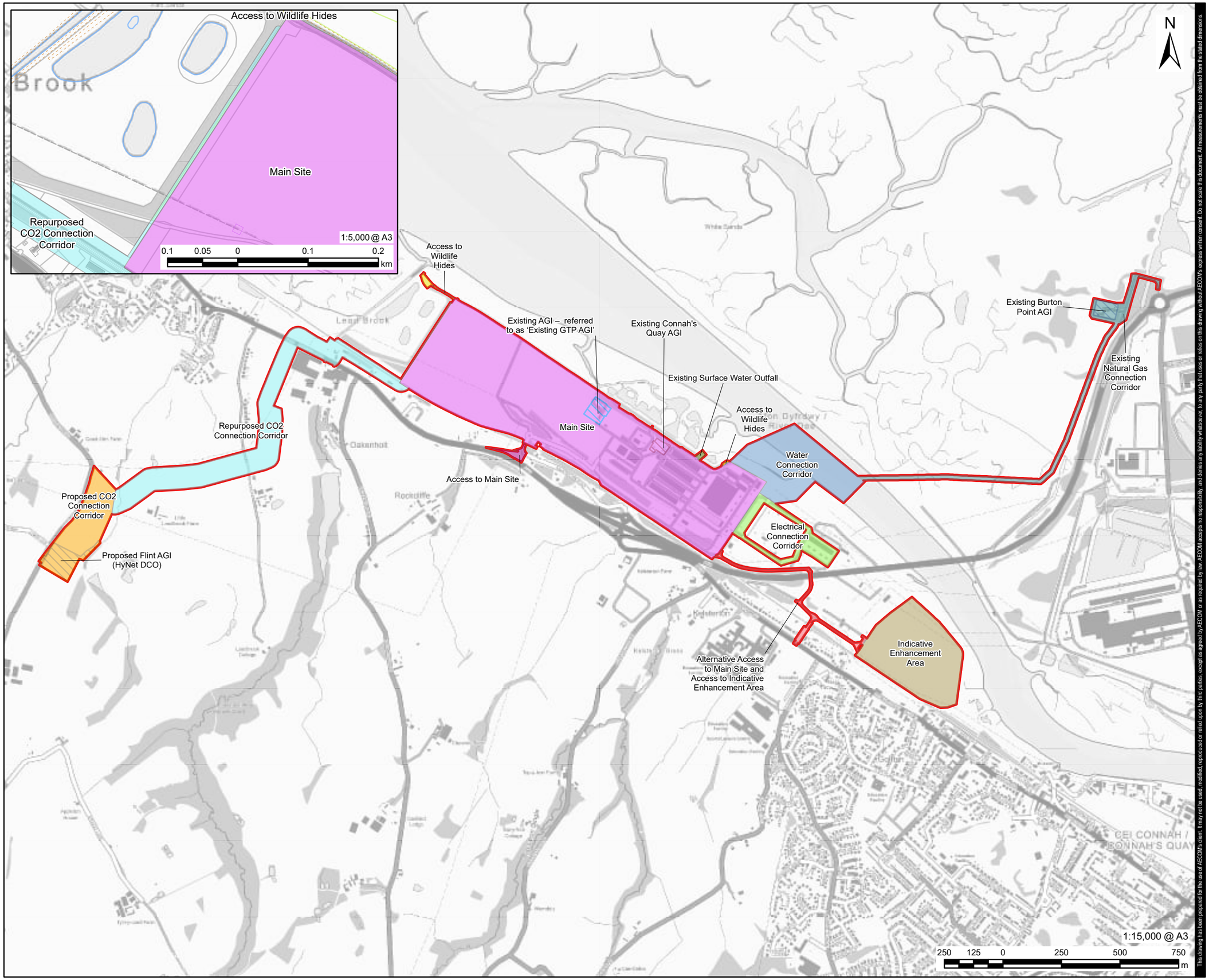

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LEGEND

- Indicative Site Boundary
- Access to Main Site
- Access to Wildlife Hides
- Alternative Access to Main Site and Access to Indicative Enhancement Area
- Electrical Connection Corridor
- Repurposed CO2 Connection
- Existing AGI – referred to as 'Existing GTP AGI'
- Existing Surface Water Outfall
- Indicative Enhancement Area
- Main Site
- Existing Connah's Quay AGI
- Proposed CO2 Connection Corridor
- Proposed Flint AGI (HyNet DCO)
- Water Connection Corridor
- Existing Natural Gas Connection Corridor
- Existing Burton Point AGI

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The Indicative Enhancement Area is under consideration to be used for mitigation or enhancement (planting), but this does not represent a formal commitment of the Applicant at this stage of design.

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PROJECT NUMBER

60717119

FIGURE TITLE

Indicative DCO Site Layout

FIGURE NUMBER

Figure 1-3

Revision: 0 Drawn: LP Checked: JG Approved: ER Date: 2024-02-07

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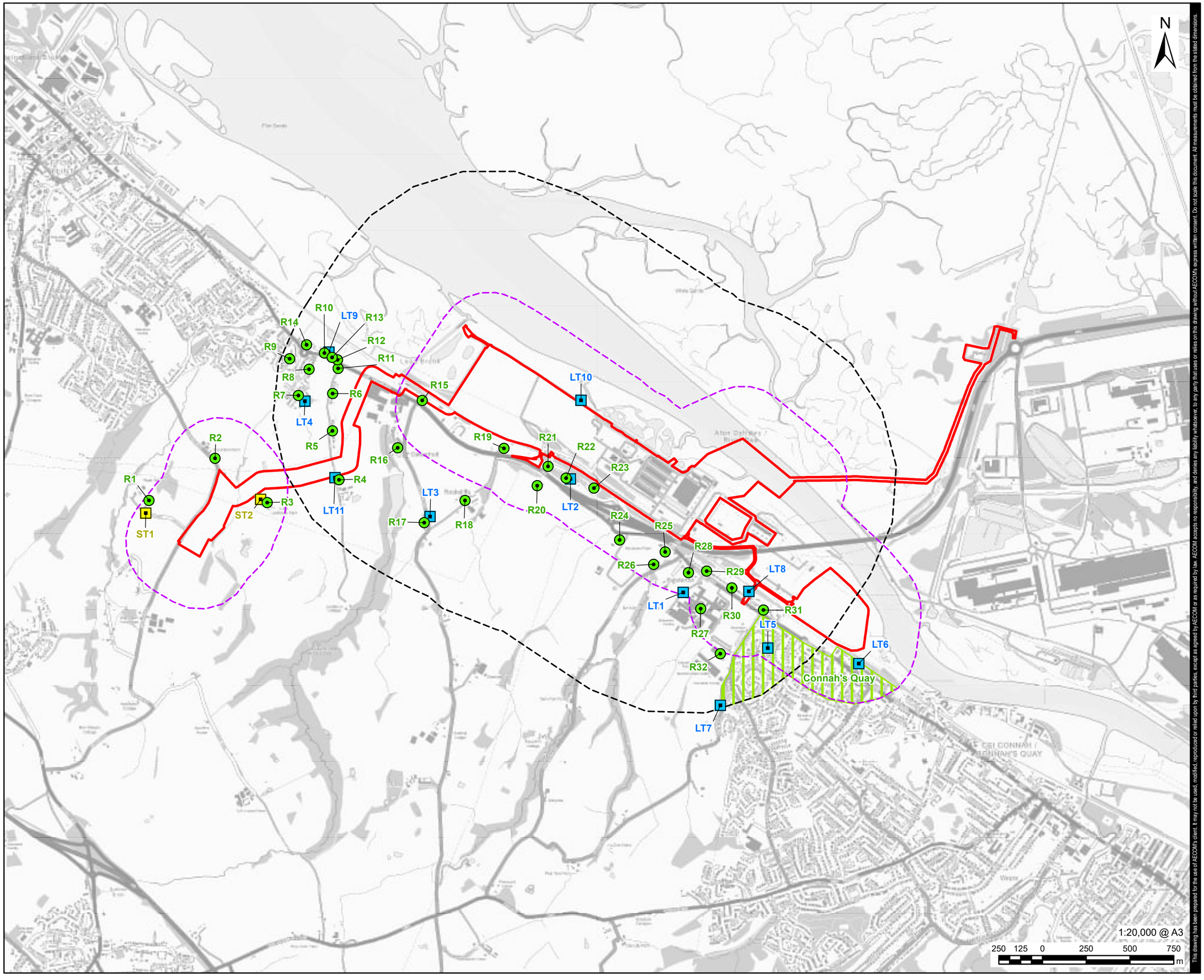

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LEGEND

- Indicative Site Boundary
- Operational Noise Sound Area (1km Buffer of the Main Site)
- Demolition and Construction Noise Study Area (1km Buffer of the Operational Site and 300m of the Construction Site)

Sound Monitoring Location

- Long
- Short

Receptor Location

- Point
- Extent

NOTES

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Demolition and Construction Noise Study Area, Operational Noise Study Area, Sensitive Receptors and Baseline Sound Monitoring Locations

FIGURE NUMBER

Figure 7-1

Revision: 0 Drawn: LP Checked: JG Approved: BB Date: 2024-01-31

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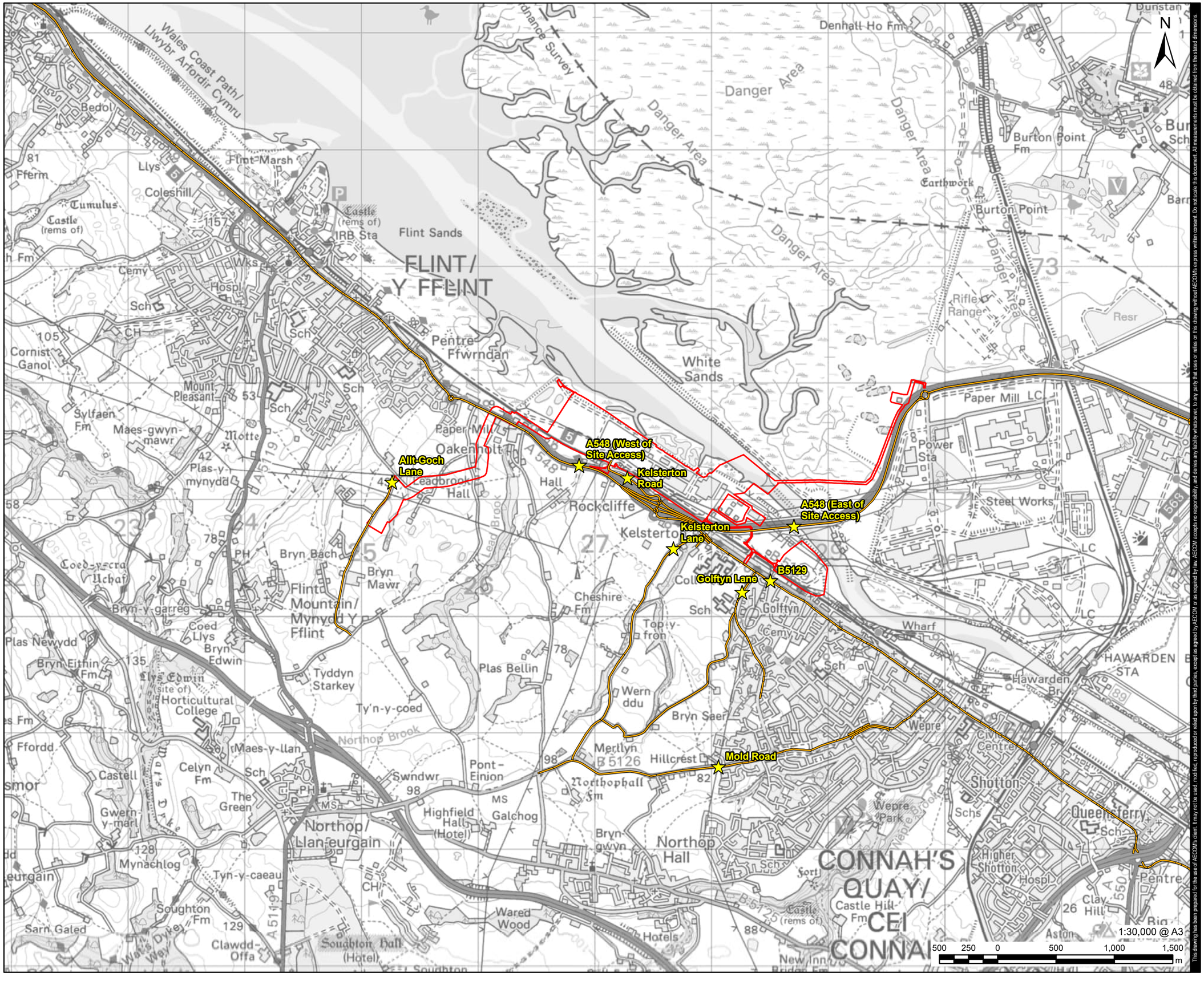

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LEGEND

- Indicative Site Boundary
- Proposed Traffic Survey Location
- Proposed Traffic Survey Road

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FIGURE TITLE

Proposed Locations for Traffic Surveys

FIGURE NUMBER

Figure 8-2

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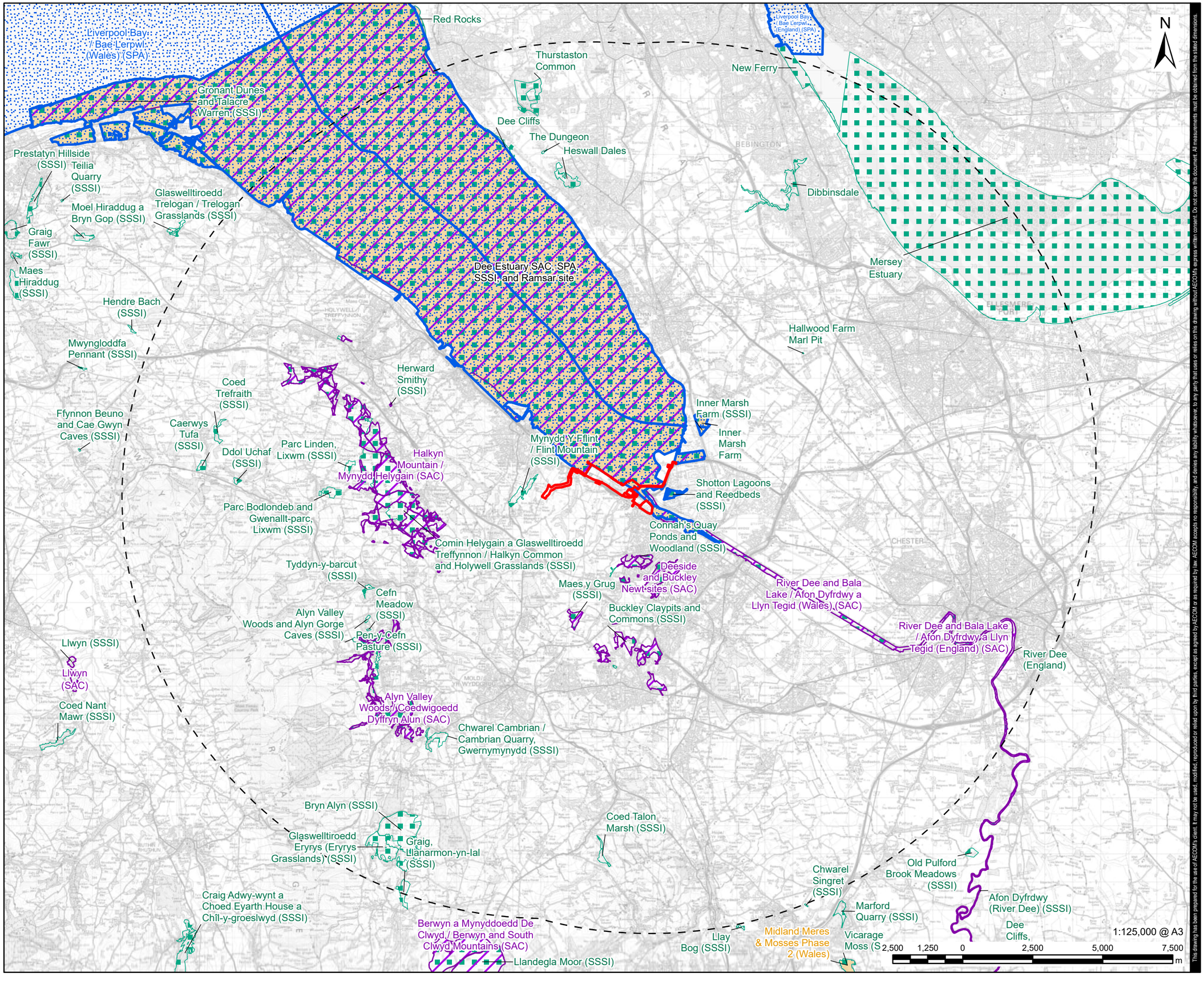

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LEGEND

- Indicative Site Boundary
- Study Area (15km Buffer of the Indicative Site Boundary)
- Ramsar Wetlands of international importance
- Special Protection Areas (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)

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PROJECT NUMBER

60717119

FIGURE TITLE

Habitat Sites and National Designated Sites within 15 km

FIGURE NUMBER

Figure 9-1

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Dee Estuary / Aber Afon Dyfrdwy(SSSI)

Inner Marsh Farm(SSSI)

Mynydd Y Fflint / Flint Mountain(SSSI)

Shotton Lagoons and Reedbeds(SSSI)

Gathering Grounds Woods & Llwyni Pond

Connah's Quay Ponds and Woodland(SSSI)

Afon Dyfrdwy (River Dee)(SSSI)

N

1:30,000 @ A3

500 250 0 500 1,000 1,500 m

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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)

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PROJECT NUMBER

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FIGURE TITLE

National and Local Designated Sites within 2 km

FIGURE NUMBER

Figure 9-2

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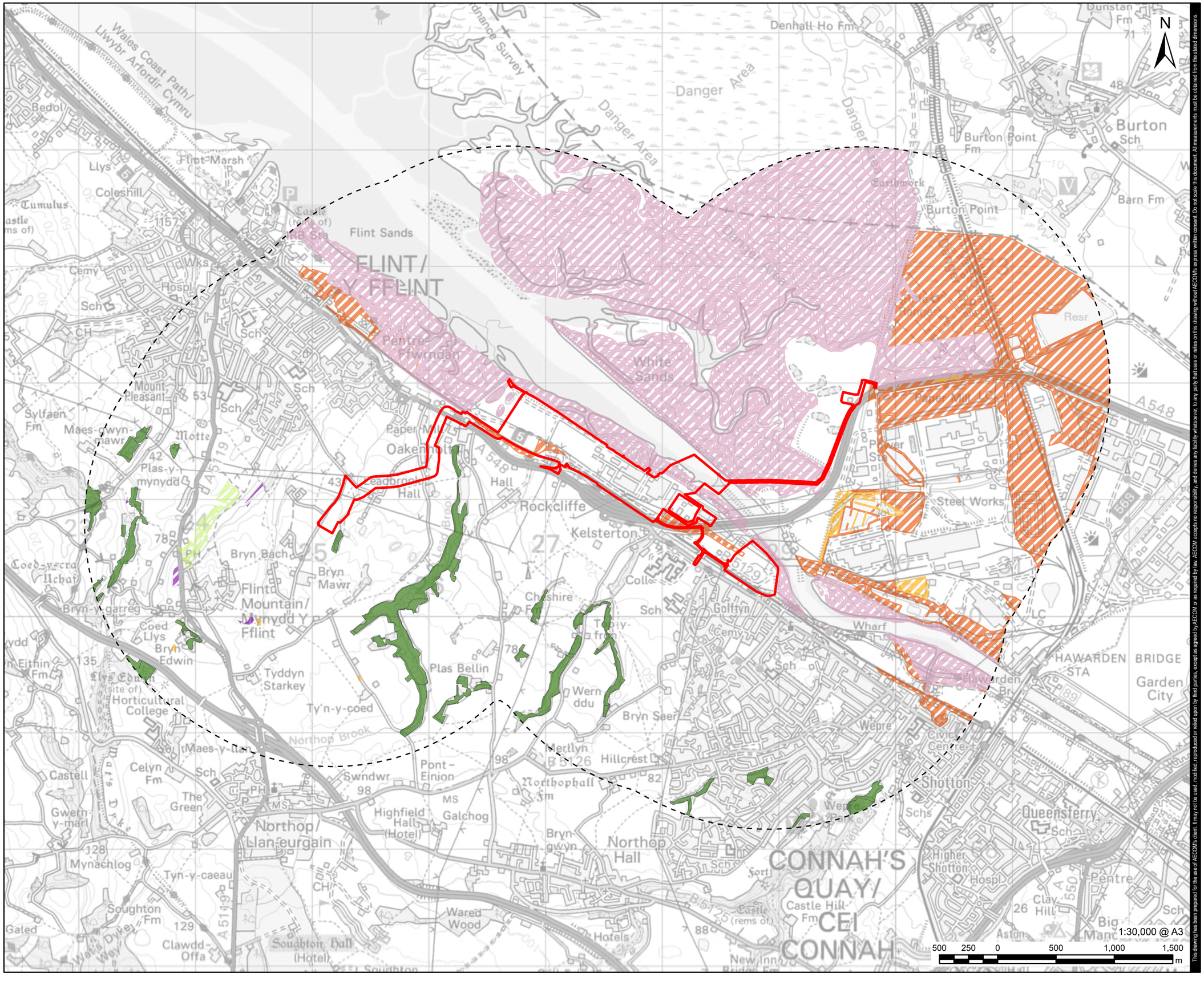

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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)
- Ancient Woodland

Priority Habitat

- Coastal and Floodplain Grazing Marsh
- Lowland fens and Reedbeds
- Lowland meadows
- Purple moor grass and rush pastures
- Saltmarsh

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FIGURE TITLE

Ancient Woodlands and Priority Habitats within 2 km

FIGURE NUMBER

Figure 9-3

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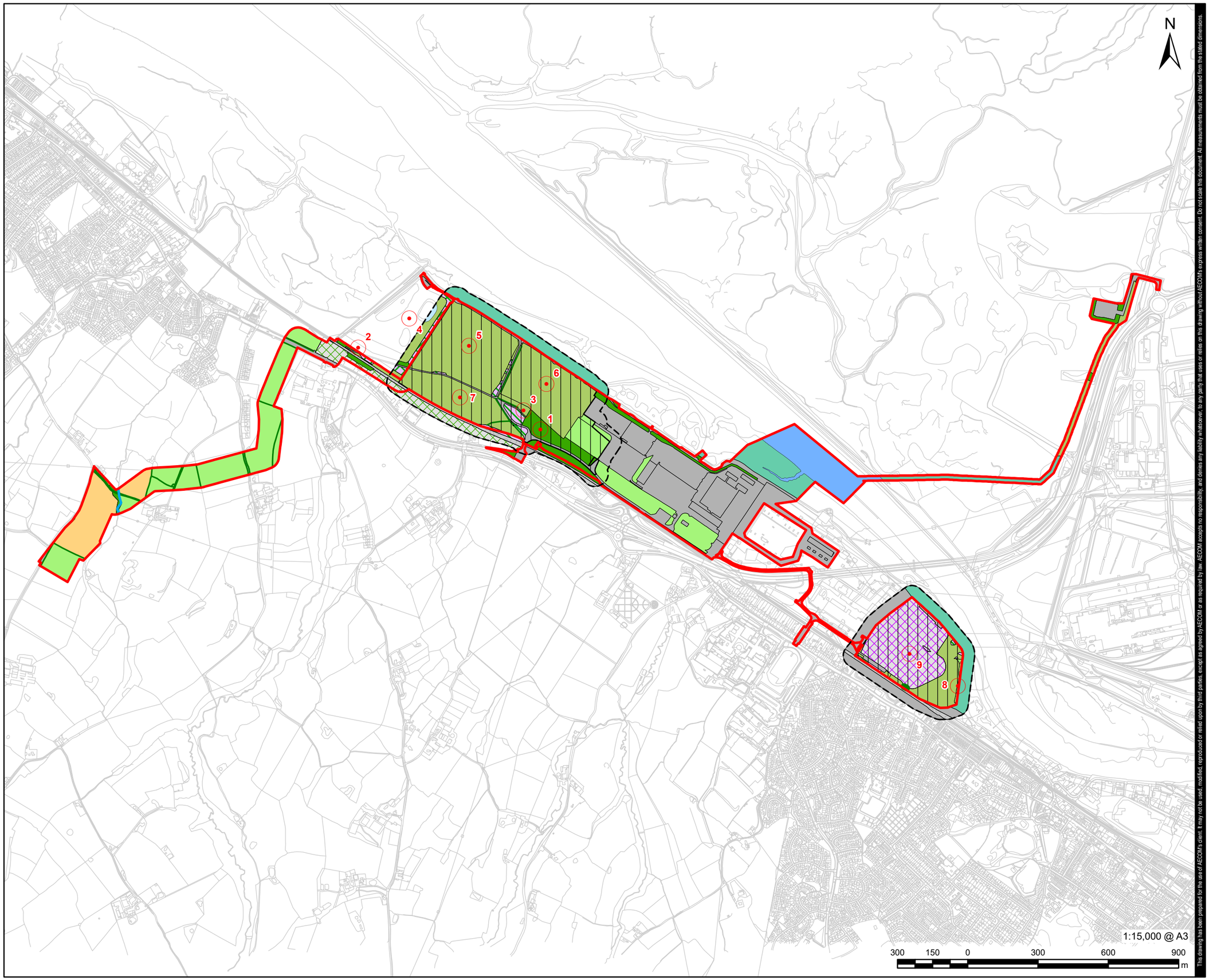

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LEGEND

- Indicative Site Boundary
- Area Accessed on Site
- 50m Buffer of the Area Accessed on Site
- Coastal saltmarsh - Saltmarshes and saline reedbeds
- Cropland - Cereal crops
- Grassland - Bracken
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Urban - Open Mosaic Habitats on Previously Developed Land
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Rivers
- Other Standing Water Ponds
- Native hedgerow
- Other Rivers And Streams
- A3.1 - Broadleaved parkland/ scattered trees
- Target Note

NOTES

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PROJECT NUMBER

60717119

FIGURE TITLE

Indicative UK Habitats

FIGURE NUMBER

Figure 9-4

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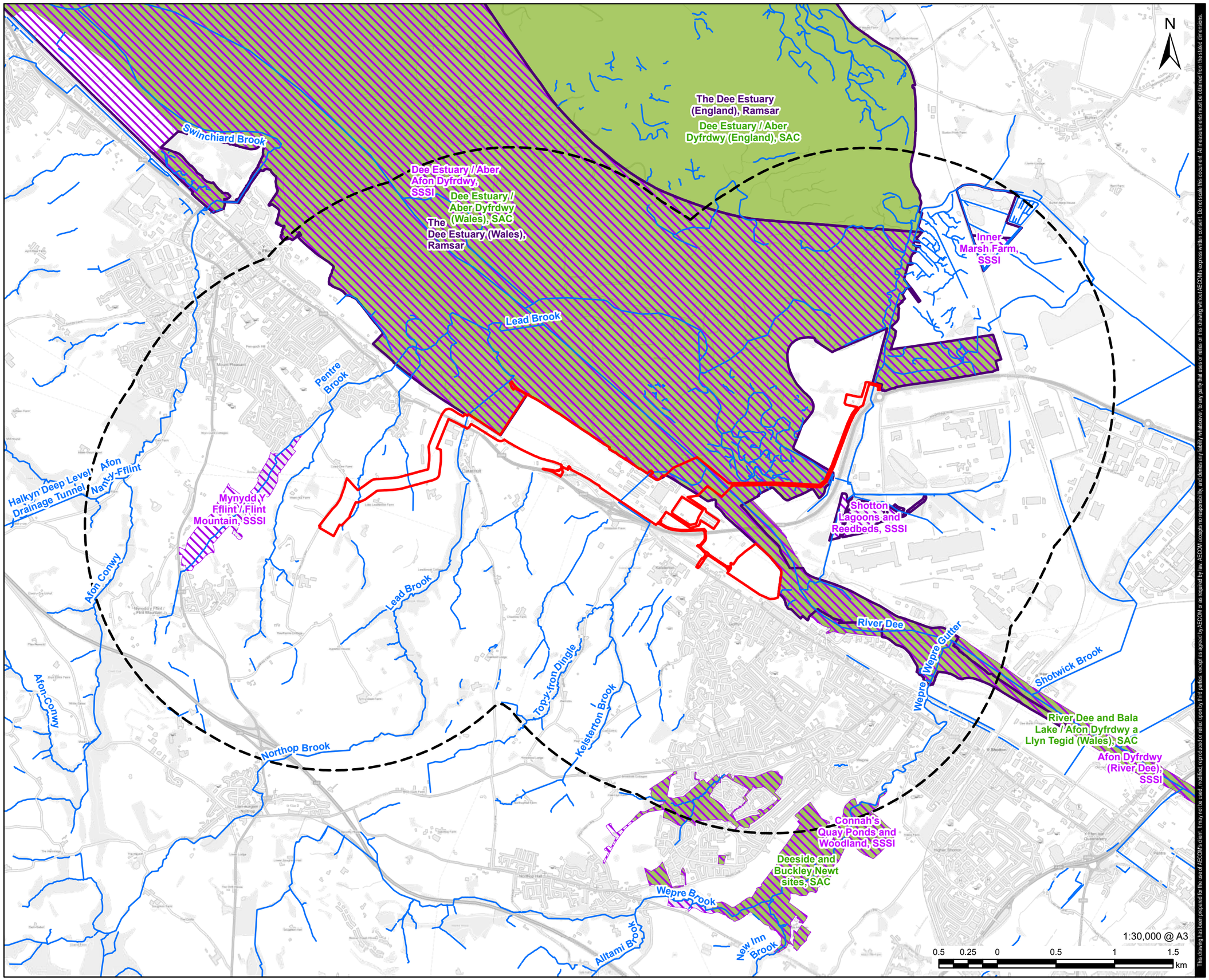
Revision: 0 Drawn: LP Checked: JG Approved: BK Date: 2024-01-30



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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of theIndicative Site Boundary)
- Surface Watercourse
- Ramsar
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)

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60717119

FIGURE TITLE

Surface Water Features

FIGURE NUMBER

Figure 11-1

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\Powerand\CCS\900_CAD_GIS\920_GIS\02_Maps\Scoping Report\CO_SCO_Chater11_Water_20240130.aprx

Revision: 0 Drawn: LP Checked: JG Approved: KB Date: 2024-02-01

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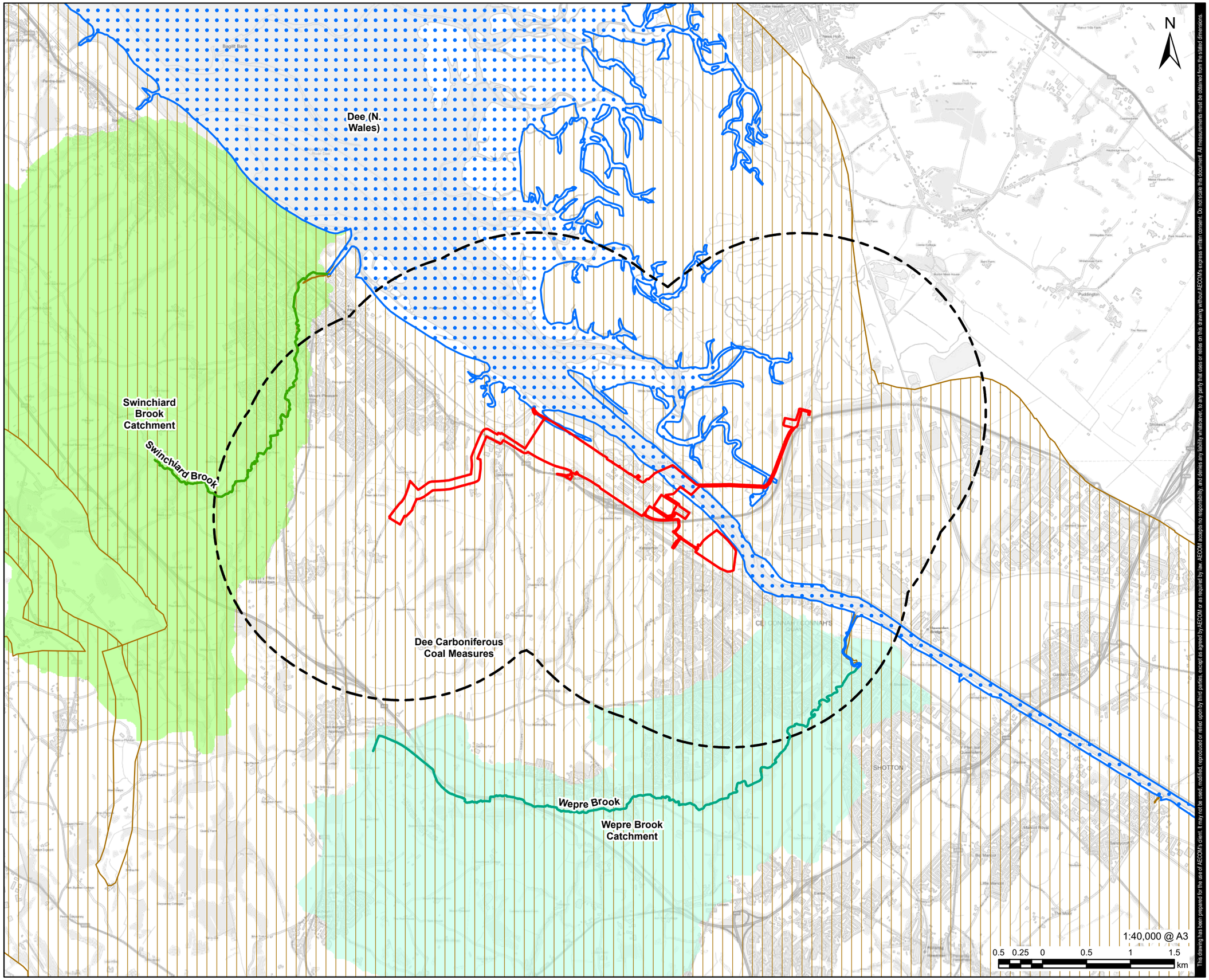

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Connah's Quay Low Carbon Power

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CONSULTANT

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Leeds
LS11 9AR
www.aecom.com

LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)

WFD Cycle 3 River Waterbody

- Swinchiard Brook
- Wepre Brook

WFD Cycle 3 River Waterbody Catchment

- Swinchiard Brook
- Wepre Brook

WFD Cycle 3 Transitional Waterbody

- Dee (N. Wales)

WFD Cycle 3 Ground Waterbody

- Dee Carboniferous Coal Measures

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

WFD Waterbodies

FIGURE NUMBER

Figure 11-2

Revision: 0 Drawn: LP Checked: JG Approved: KB Date: 2024-01-30

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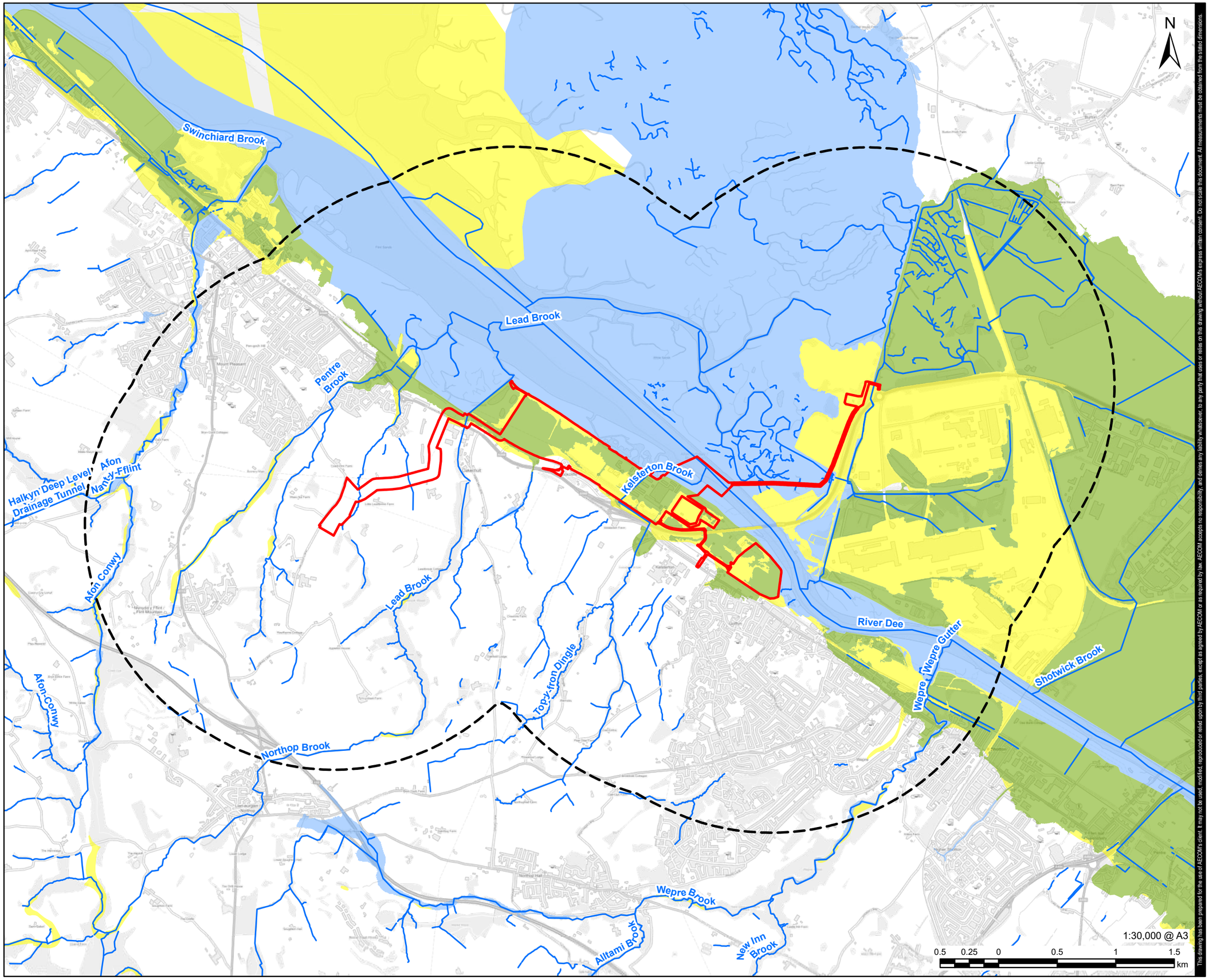

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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)
- Surface Watercourse

Development Advice Map (DAM)

- Zone C1
- Zone C2
- Zone B

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Development Advice Map Zones

FIGURE NUMBER

Figure 11-3

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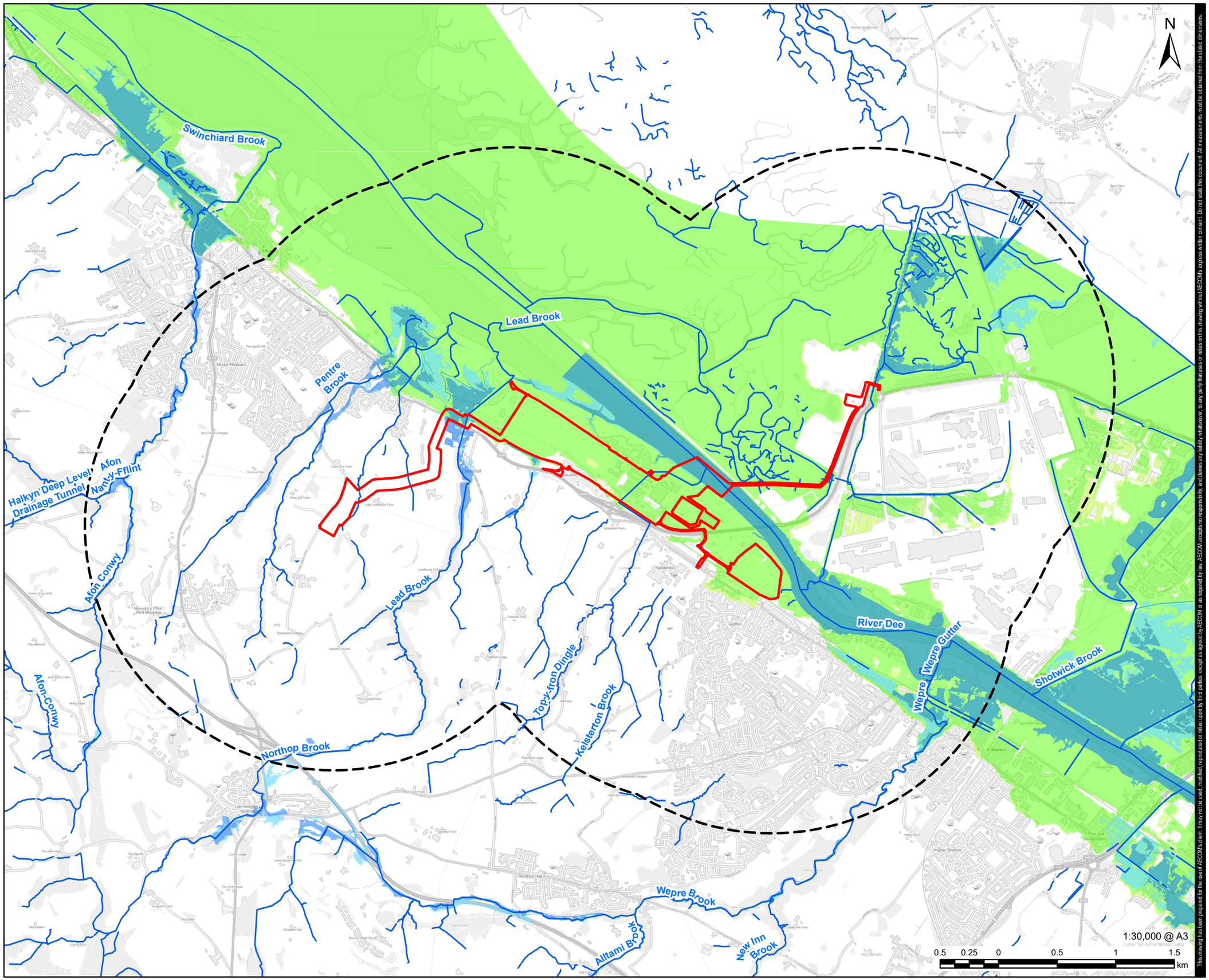

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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Red Line Boundary)
- Surface Watercourse

Flood Risk Assessment - Risk from Rivers

- Flood Zone 2
- Flood Zone 3

Flood Risk Assessment - Risk from Seas

- Flood Zone 2
- Flood Zone 3

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Flood Map for Planning (Rivers and Seas)

FIGURE NUMBER

Figure 11-4

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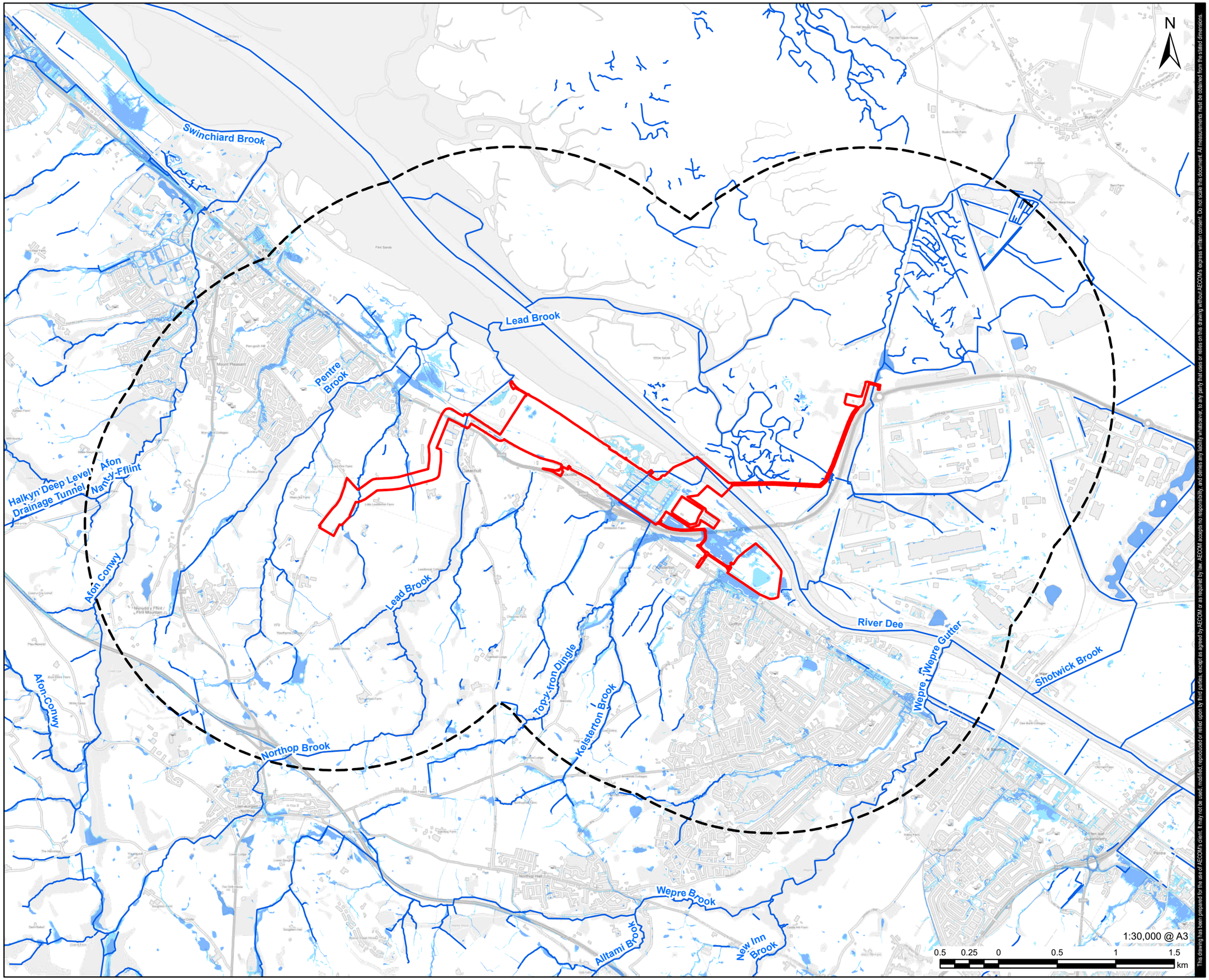

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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)
- Surface Watercourse

Flood Risk Assessment - Risk from Surface Water and Small Watercourses

- Flood Zone 2
- Flood Zone 3

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Surface Water Flood Risk

FIGURE NUMBER

Figure 11-5

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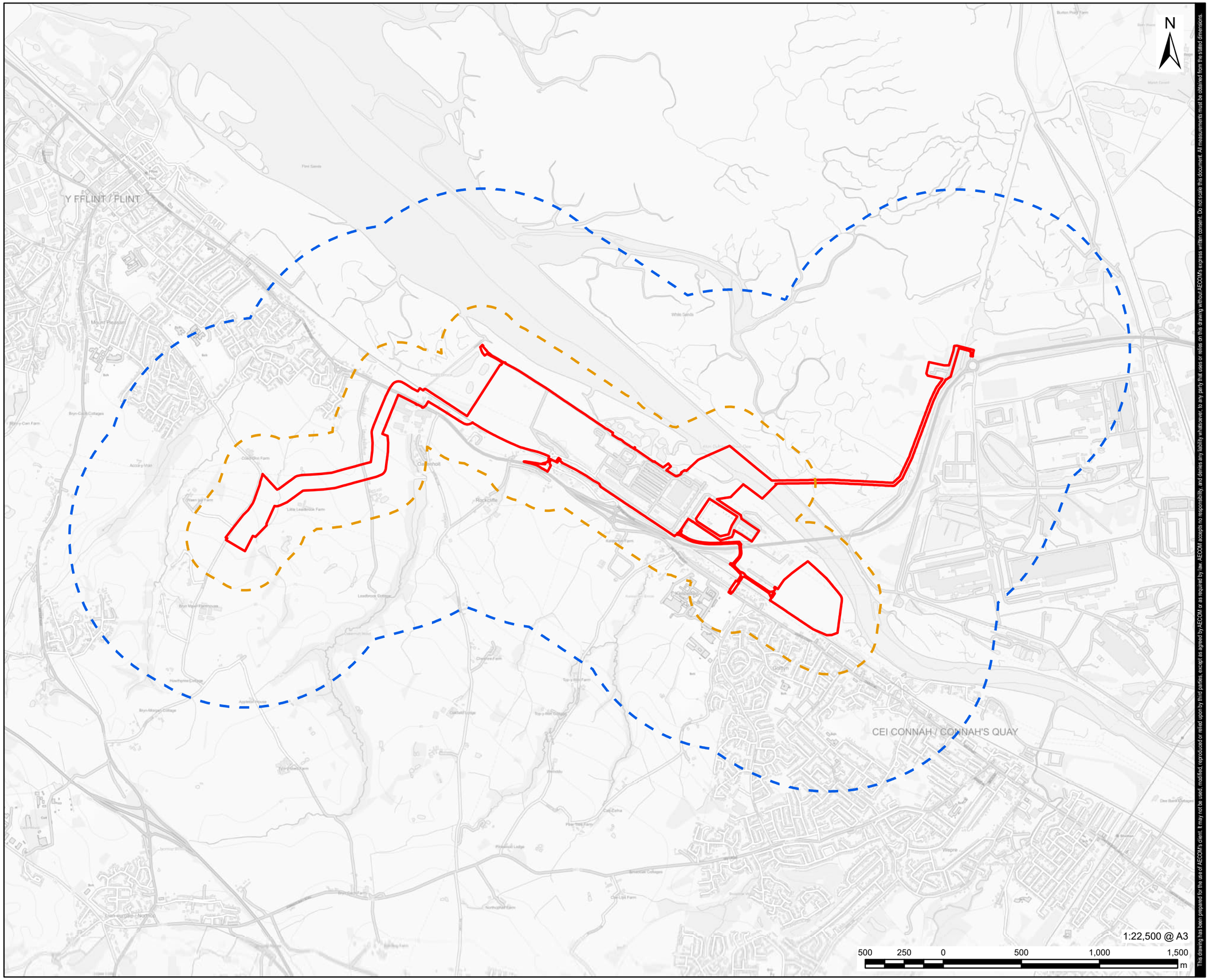

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LEGEND

- Indicative Site Boundary
- Geology and Land Contamination Study Area (250m Buffer of the Indicative Site Boundary**)
- Hydrogeology Study Area (1km Buffer of the Indicative Site Boundary)

NOTES

** Excluding the existing natural gas connection corridor and Burton Point AGI.

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

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FIGURE TITLE

Geology and Ground Conditions Areas

FIGURE NUMBER

Figure 12-1

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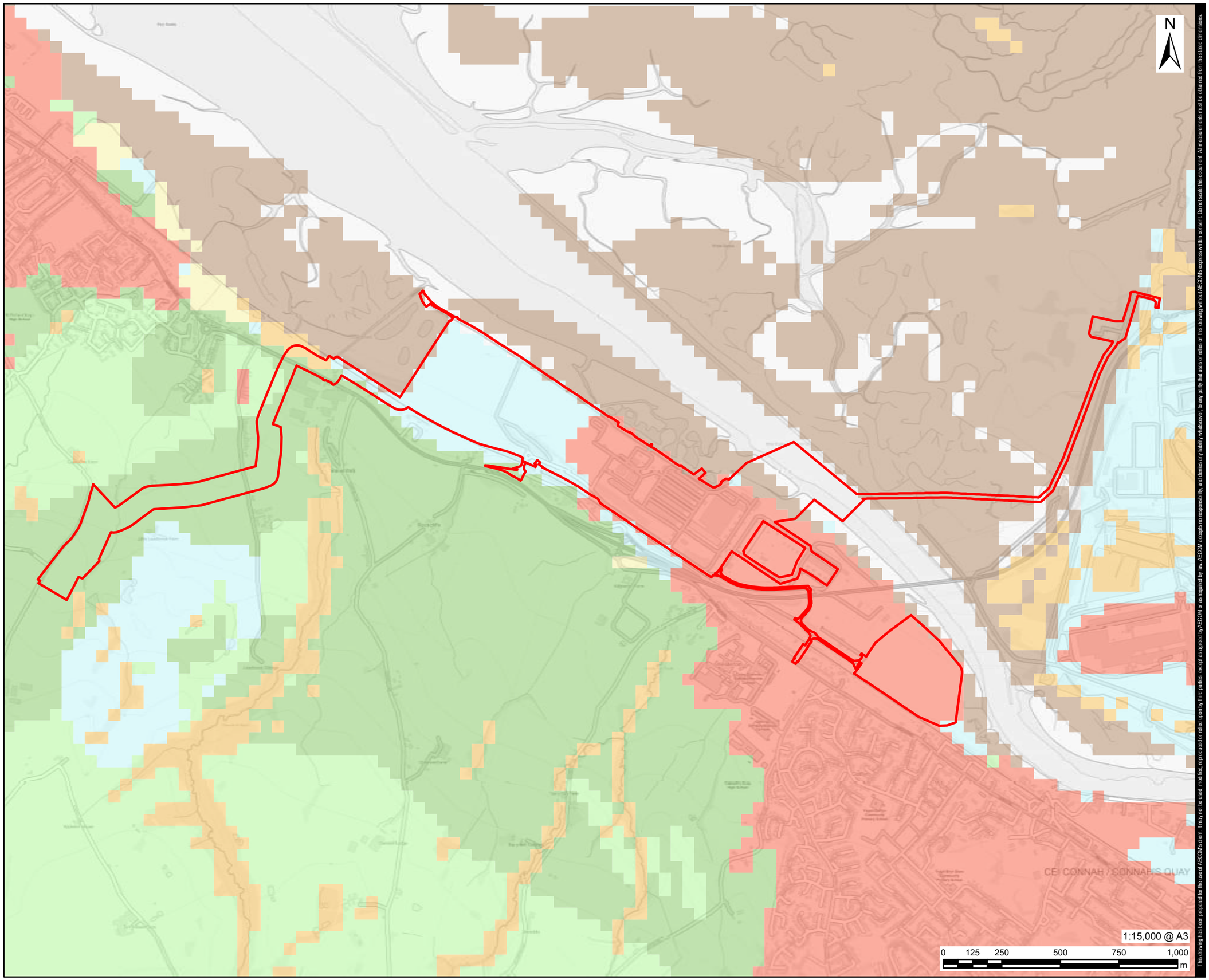
Revision: 0 Drawn: JG Checked: AB Approved: EB Date: 2024-01-31

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\PowerandCCS\900_CAD_GIS\920_GIS\02_Maps\Scoping Report\CQ_SCO_Fig12_2_PredictiveALC_20230131_01.aprx



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LEGEND

- Indicative Site Boundary

Predictive Agricultural Land Classification (ALC)

- Grade 2
- Subgrade 3a
- Subgrade 3b
- Grade 4
- Grade 5
- Non Agricultural
- Urban

NOTES

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

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FIGURE TITLE

Predictive Agricultural Land Classification (ALC) Map

FIGURE NUMBER

Figure 12-2

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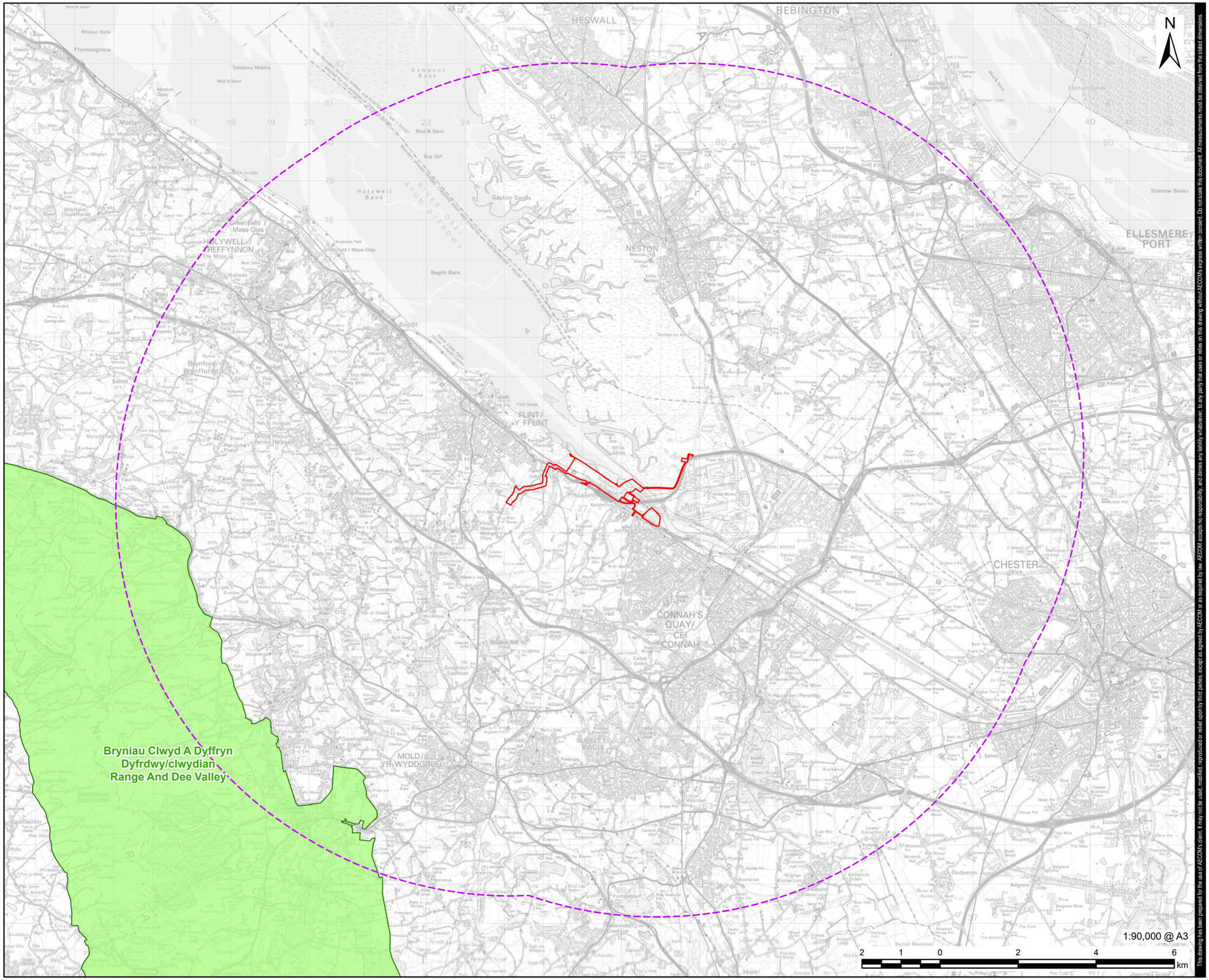

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Study Area (10km Buffer of the Indicative Site Boundary)
- National Landscape

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

National Landscape Designations

FIGURE NUMBER

Figure 13-1

Revision: 0 Drawn: LP Checked: JG Approved: FH Date: 2024-01-31

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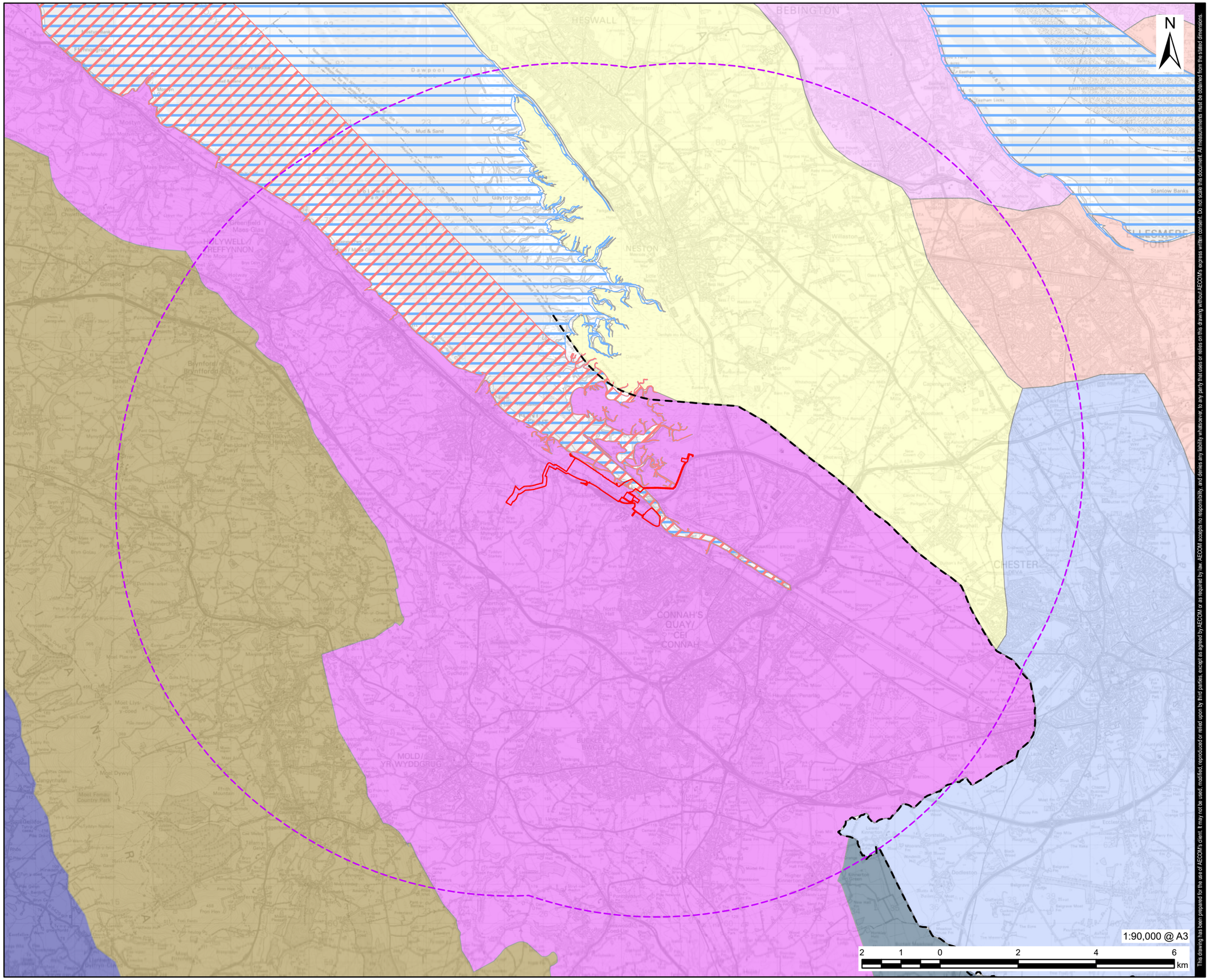

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Study Area (10km Buffer of the Indicative Site Boundary)
- England & Wales Border

Landscape Character Area (Wales)

- 11 - Dyffryn Clwyd / Vale of Clwyd
- 12 - Bryniau Clwyd / Clwydian Range
- 13 - Glannau Dyfrdwy a Wrecsam / Deeside and Wrexham
- 14 - Maelor Saesneg / Maelor

National Character Area (England)

- 58 - Merseyside Conurbation
- 59 - Wirral
- 60 - Mersey Valley
- 61 - Shropshire, Cheshire and Staffordshire Plain

Marine Character Area (Wales)

- 01 - Dee Estuary (Wales)

MMO Marine Character Area (England)

- MCA 36 - Dee and Mersey Estuaries and Coastal Waters

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

National Landscape and Marine Character Areas

FIGURE NUMBER

Figure 13-2

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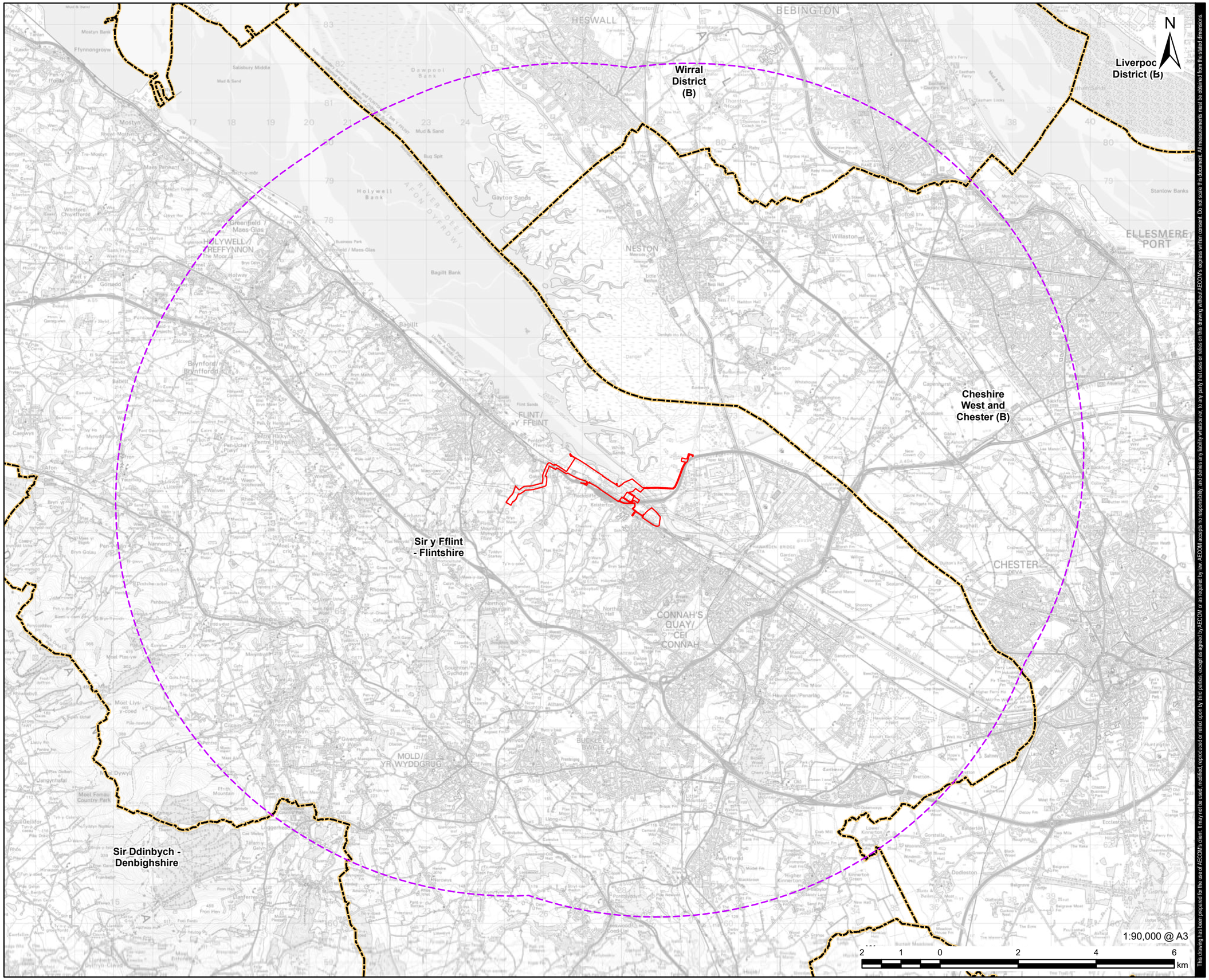

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Study Area (10km Buffer of the Indicative Site Boundary)
- Local Authority Boundary

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

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FIGURE TITLE

Local Authority Boundaries

FIGURE NUMBER

Figure 13-3

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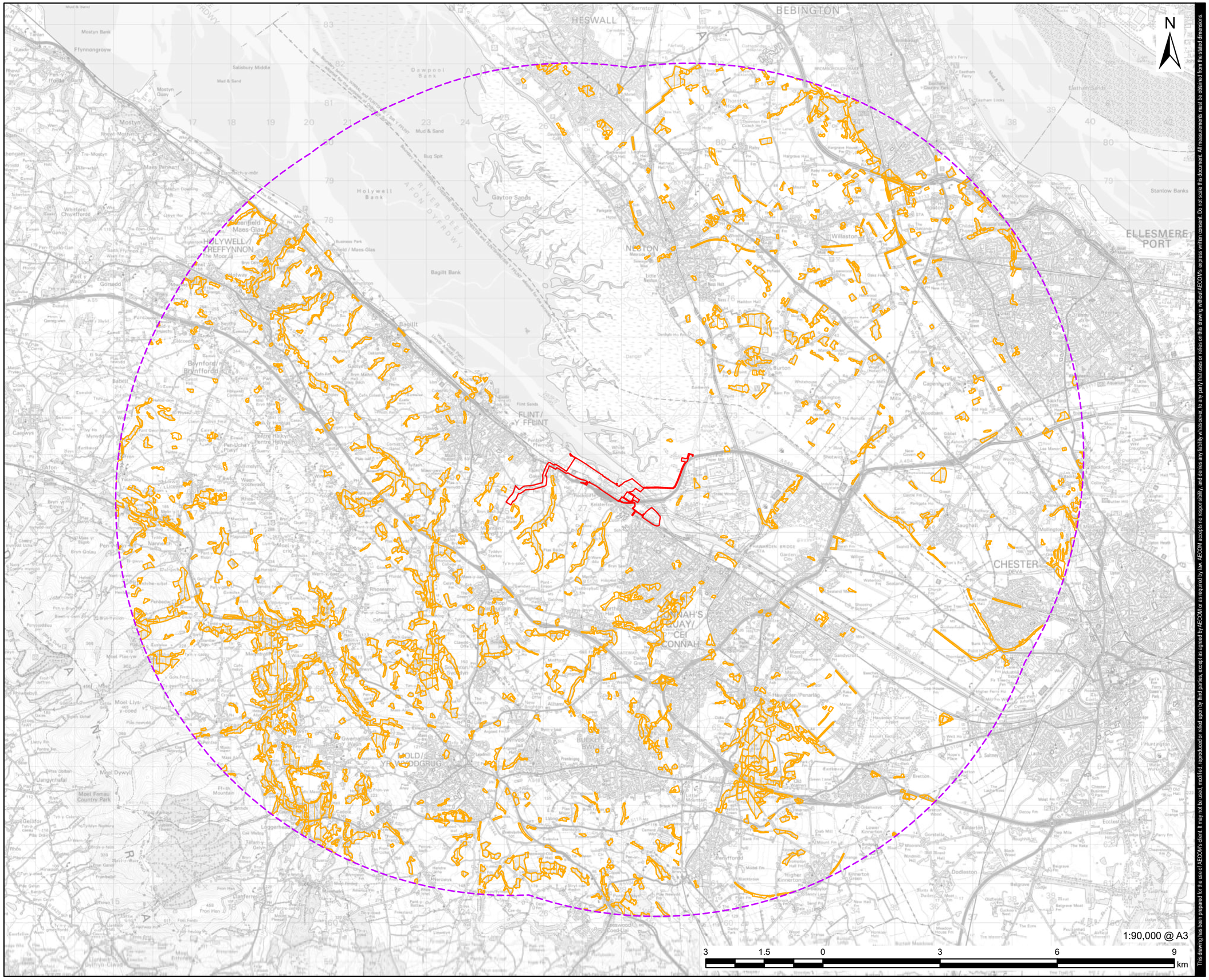

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Study Area (10km Buffer of the Indicative Site Boundary)
- National Forest Inventory

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ISSUE PURPOSE

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60717119

FIGURE TITLE

National Forest Inventory

FIGURE NUMBER

Figure 13-4

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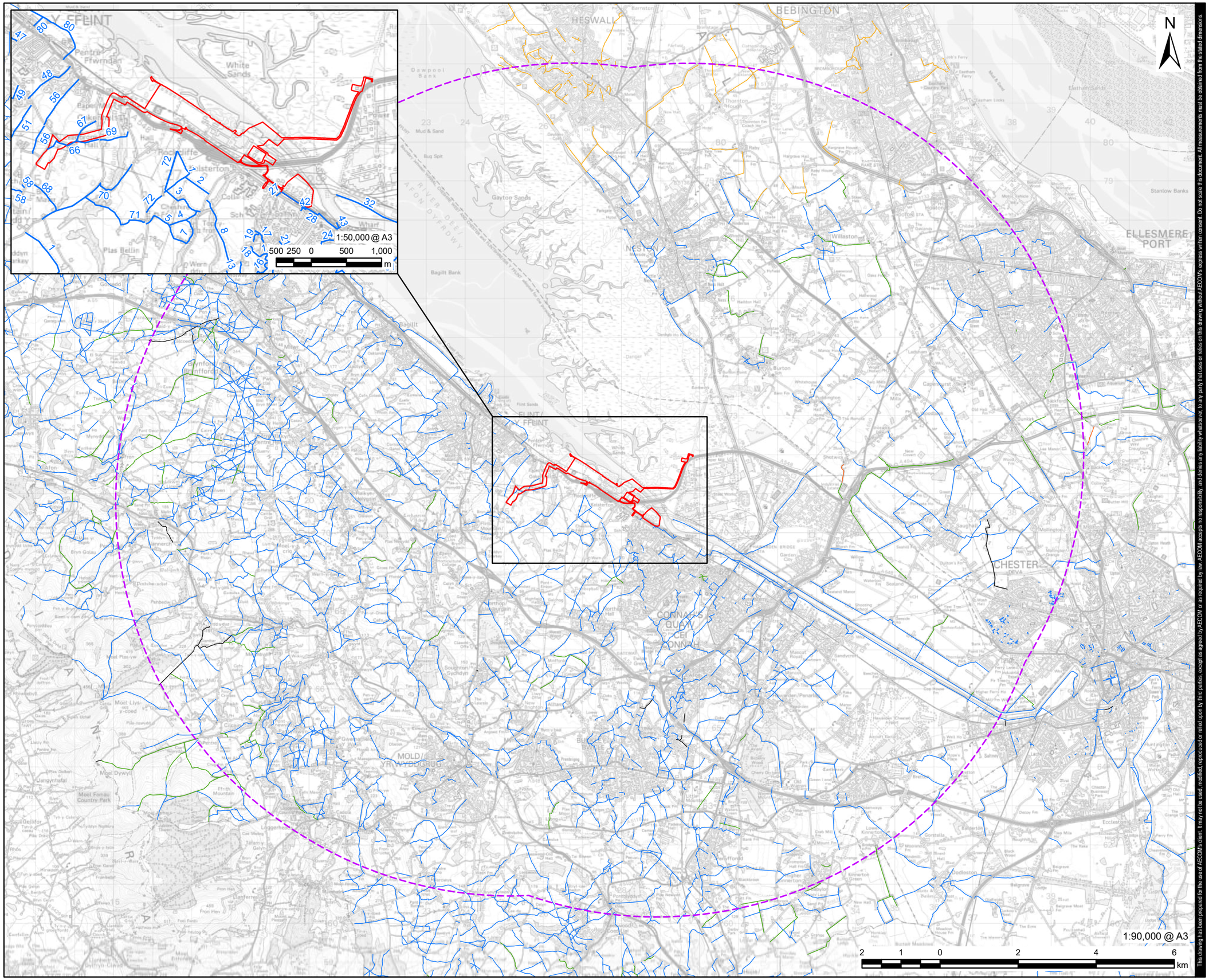

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Study Area (10km Buffer of the Indicative Site Boundary)

Public Right of Way (PRoW)

- Footpath
- Byway Open to All Traffic (BOAT)
- Bridleway
- Restricted Byway
- Unclassified Public Rights of Way (Wirral Only)

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Public Rights of Way

FIGURE NUMBER

Figure 13-5

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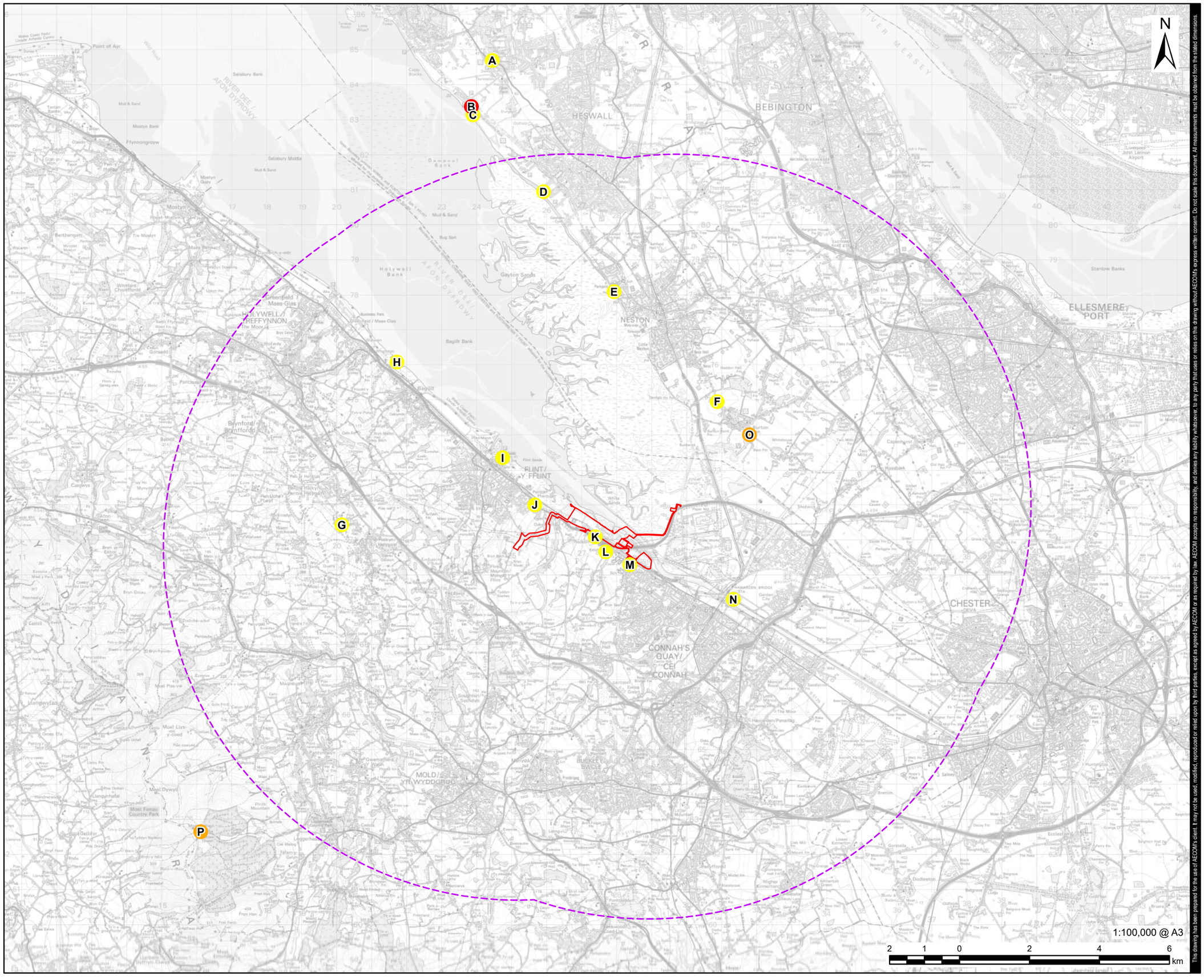

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Study Area
- Indicative Viewpoint Location
- Indicative Viewpoint to be omitted due to close proximity of views
- Indicative Viewpoint Location to consider in next stage

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FIGURE TITLE

Indicative Viewpoint Locations

FIGURE NUMBER

Figure 13-6

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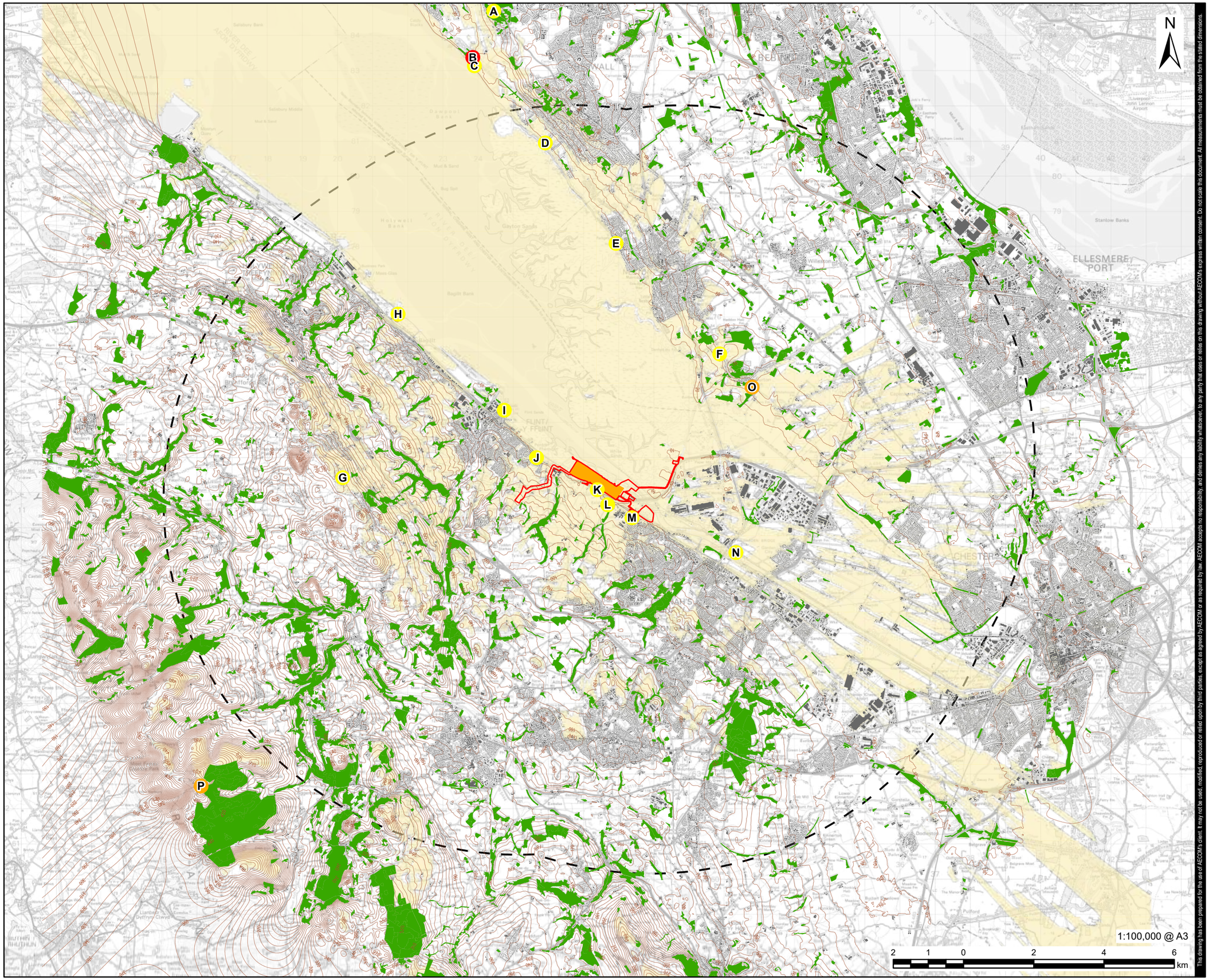

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Amenity Study Area (10km Buffer of the Indicative Site Boundary)
- Indicative Viewpoint Location
- Indicative Viewpoint to be omitted due to close proximity of views
- Indicative Viewpoint Location to consider in next stage
- Contour (10m Interval)
- Indicative Main Site Area
- Woodland - National Forest Inventory - 12m Height
- Existing Building - 8m Height

Zone of Theoretical Visibility - Main Site Area - 56m Height

- Visible

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Zone of Theoretical Visibility (ZTV) has been generated using Ordnance Survey Terrain 5 digital terrain mode (DTM). The DTM does not take into account the screening effect of vegetation, buildings and other structures. Existing buildings have been incorporated into the DTM from OS Open Map Local at an assumed height of 8m. Woodland has been incorporated into the DTM from the National Forest Inventory with an assumed height of 12m. ZTV is based upon a grid of points at 50m apart within the main site area at a height of 56.9m, 0.9 m was added to account for the ground being raised for flood requirements. An observer eye height of 1.6m was also used. All heights mentioned above are above ground level (AGL) unless otherwise specified.

ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Zone of Theoretical Visibility - 56m Building Height

FIGURE NUMBER

Figure 13-7

Revision: 0 Drawn: LP Checked: JG Approved: FH Date: 2024-02-02

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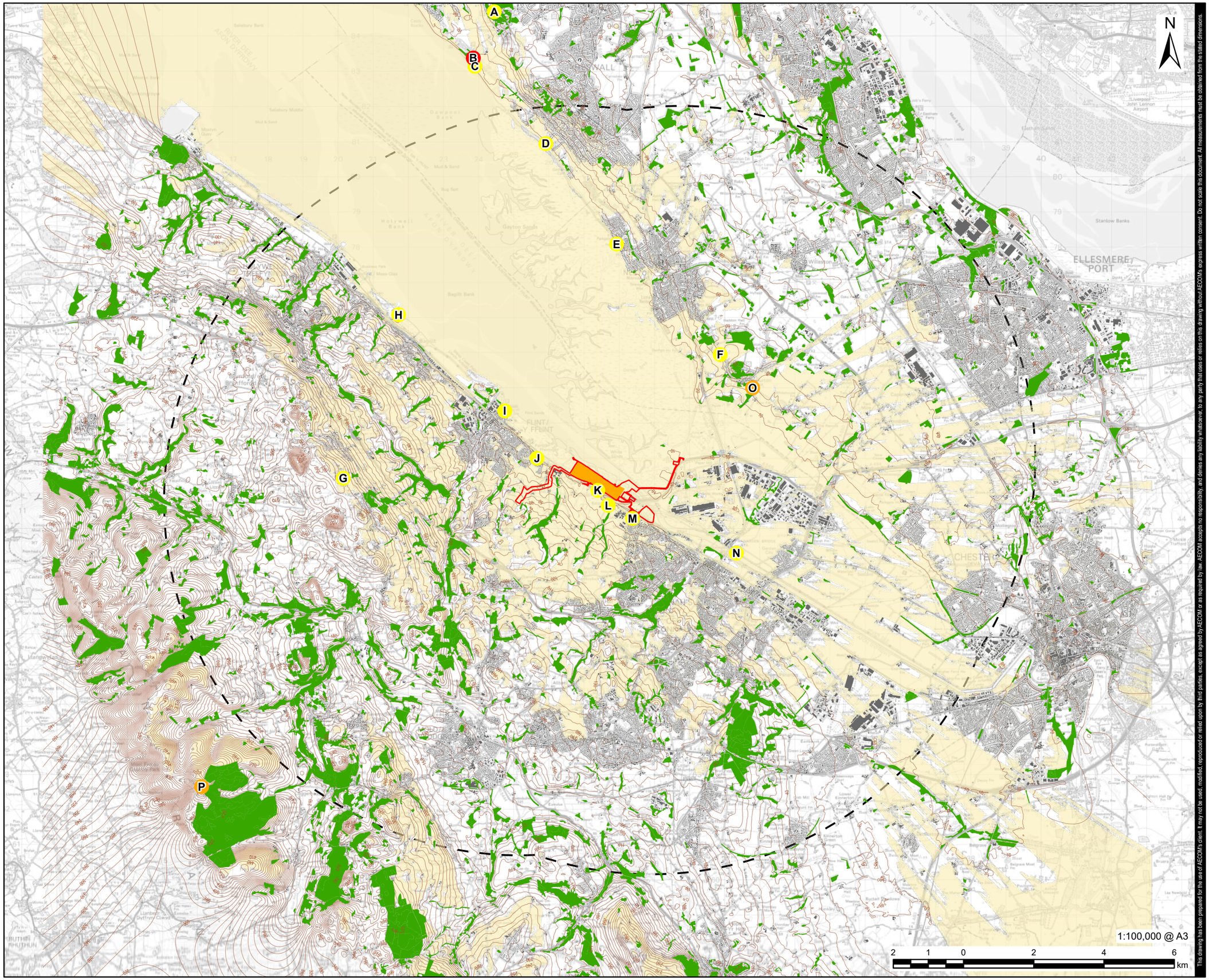

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AECOM

PROJECT

Connah's Quay Low Carbon Power

CLIENT

Uniper

CONSULTANT

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LEGEND

- Indicative Site Boundary
- Landscape and Visual Amenity Study Area (10km Buffer of the Indicative Site Boundary)
- Indicative Viewpoint Location
- Indicative Viewpoint to be omitted due to close proximity of views
- Indicative Viewpoint Location to consider in next stage
- Contour (10m Interval)
- Indicative Main Site Area
- Woodland - National Forest Inventory - 12m Height
- Existing Building - 8m Height

Zone of Theoretical Visibility - Main Site Area - 105m Height

- Visible

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ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Zone of Theoretical Visibility - 105m Building Height

FIGURE NUMBER

Figure 13-8

Revision: 0 Drawn: JG Checked: AB Approved: AP Date: 2024-01-30

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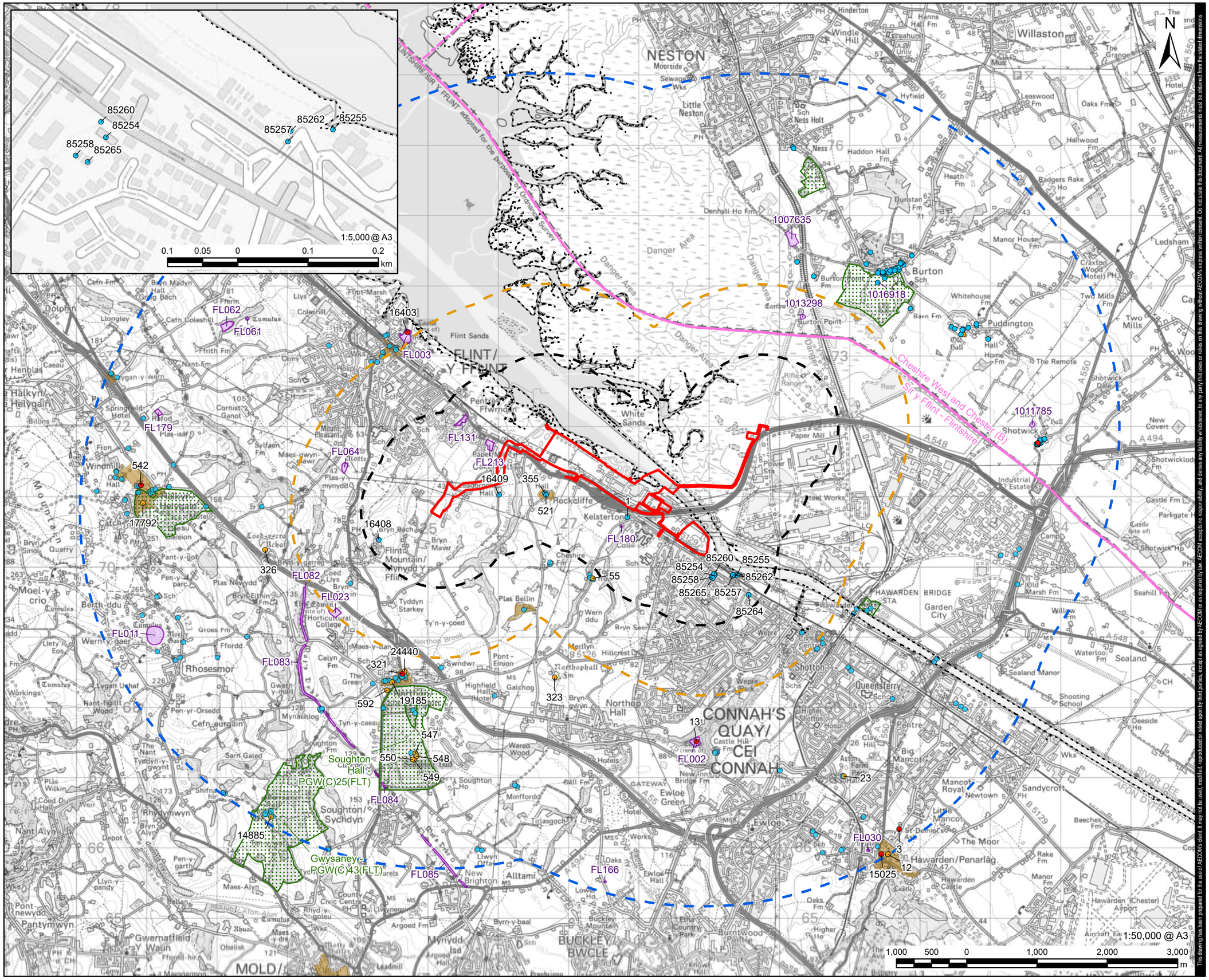

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LEGEND

- Indicative Site Boundary
- 1km Study Area
- 2km Study Area
- 5km Study Area
- High Water Mark

Listed Buildings

- Grade I
- Grade II*
- Grade II
- Scheduled Monument
- Registered Parks and Garden
- Conservation Area

NOTES

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ISSUE PURPOSE

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FIGURE TITLE

Designated Heritage

FIGURE NUMBER

Figure 15-1

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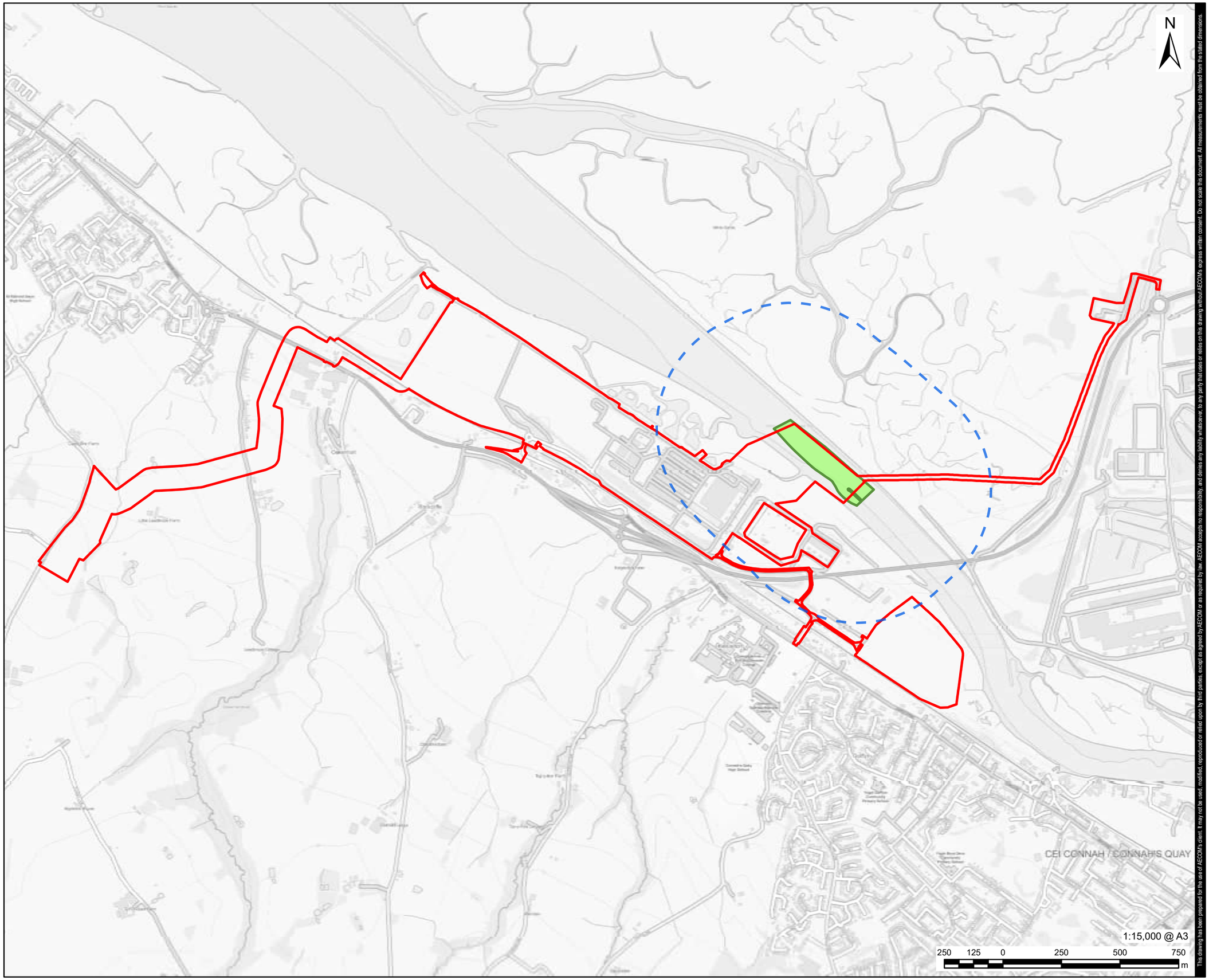

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LEGEND

- Indicative Site Boundary
- Marine and Cultural Heritage Study Area
- Marine and Cultural Heritage Study Area Buffer (500m Buffer of the Indivative Site Boundary)

NOTES

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Marine and Cultural Study Area provided by Wessex Archaeology 2023.

ISSUE PURPOSE

First Issue

PROJECT NUMBER

60717119

FIGURE TITLE

Location of Marine and Cultural Heritage Study Area

FIGURE NUMBER

Figure 15-2

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\PowerandCCS\900_CAD_GIS\920_GIS\02_Maps\Scoping Report\CQ_SCO_Fig15_2_MarineandCulturalHeritageStudyArea_20240130_01.aprx

Appendix B Preliminary Ecological Appraisal

Connah's Quay Combined Cycle Gas Turbine (CCGT) with Carbon Capture

Preliminary Ecological Appraisal Report

Document Reference 60717119

Uniper

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
JC Senior Ecologist	KW Technical Director	MWH Associate Ecologist	

Prepared for:

Uniper

Prepared by:

AECOM Limited

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Executive Summary

Overview

This Preliminary Ecological Appraisal (PEA) has been prepared on behalf of Uniper UK Limited (hereafter referred to as the 'the Applicant') to assess the ecological constraints and opportunities in connection with the proposed construction, operation and decommissioning of a Combined Cycle Gas Turbine (CCGT) Generating Plant fitted within Carbon Capture Plant (CCP) on land at, and in the vicinity of, the existing Connah's Quay Power Station (Kelsterton Road, Connah's Quay, Flintshire, CH6 5SJ), North Wales.

An initial desk study was undertaken in November 2023 to inform the Environmental Impact Assessment (EIA) scoping stage, using publicly available resources, to:

- identify Habitat Sites (formerly known as European Sites), Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNRs) within 15 km;
- identify protected and notable habitats and other statutory designated sites within 2 km;
- review ecological survey data collected during initial surveys by Aspect Ecology; and
- map the habitats making up inaccessible areas of the Proposed Development using available aerial imagery.
- In addition, a walkover survey of accessible land within the Main Site and Indicative Enhancement Area (**Figure 5, Annex A**) was undertaken on 7 November 2023.

The walkover survey identified the need for further survey or assessment of the following Important Ecological Features:

- Designated sites;
- Habitats;
- Bats;
- Badger;
- Otter;
- Water vole;
- Great crested newt;
- Birds (wintering, breeding and passage);
- Terrestrial invertebrates; and
- Natterjack toad.

1. Introduction

1.1 Background

1.1.1 This Preliminary Ecological Appraisal (PEA) has been prepared on behalf of Uniper UK Limited (hereafter referred to as 'the Applicant'), to assess the ecological constraints in connection with the proposed construction, operation and decommissioning of a new Combined Cycle Gas Turbine (CCGT) fitted within Carbon Capture Plant (CCP) on land at, and in the vicinity of, the existing Connah's Quay Power Station (Kelsterton Road, Connah's Quay, Flintshire, CH6 5SJ), North Wales.

1.1.2 The Proposed Development is located approximately 0.6 km north-west of Connah's Quay in Flintshire, north-east Wales. The indicative land under consideration for the Proposed Development (hereafter referred to as the 'Site') is shown on **Figure 1** (**Annex A**) and is located within the administrative boundary of Flintshire County Council (FCC).

1.1.3 The assessment of ecological constraints has been undertaken with reference to current good practice. The PEA addresses relevant wildlife legislation and planning policy as summarised in **Annex B** and is consistent with the requirements of British Standard 42020:2013 *Biodiversity. Code of Practice for Planning and Development* and accords with the Guidelines for Preliminary Ecological Appraisal published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017[1]).

1.2 The Site

1.2.1 The Site and Indicative Site Layout as shown on **Figure 1** and **Figure 2** (**Annex A**) contains a number of different components which are listed below.

- The Main Site;
  - Access to the Main Site;
  - The Existing Surface Water Outfall;
  - The Access to Wildlife Hides;
- Proposed CO_2 Connection Corridor;
- Repurposed CO_2 Connection Corridor;
- Water Connection Corridor;
- Existing Natural Gas Connection Corridor;
- Electrical Connection Corridor;
- Indicative Enhancement Area; and
- Alternative Access to Main Site and Access to Indicative Enhancement Area.

[1] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal Second Edition. Available at https://cieem.net/wp-content/uploads/2018/01/Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-typo-edit.pdf

1.2.2 Further information on the Proposed Development is provided in **Chapter 3: The Proposed Development** and definitions are set out in **Chapter 1: Introduction** of the main EIA Scoping Report.

1.3 Purpose of the Preliminary Ecological Appraisal

1.3.1 This PEA presents ecological information obtained from the following sources:

- An initial desk study undertaken in November 2023 of publicly available sources including Magic[2] and the Joint Nature Conservation Committee (JNCC) website[3] which provided information on the following ecological features relevant to the Proposed Development:
  - All Habitat Sites (formerly known as International Sites), Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNRs) within 15 km.
  - All protected and notable habitats[4] and other statutory designated sites within 2 km.
- At the time of reporting, it was only possible to conduct this search using publicly available data sources, (all search areas covered by the desk study are hereafter known as the study area).
- A document review of previous ecological survey reports within the Main Site[5] and Indicative Enhancement Area commissioned by the Applicant. These surveys were confined to the Main Site and Indicative Enhancement Area of the Proposed Development. The reports included the following:
  - Phase 1 Habitat and Faunal Surveys;[6]
  - Breeding, Passage and Wintering Bird Surveys; and[7]
  - Reptile Surveys.[8]
- A walkover survey on 7 November 2023 of accessible land within the Main Site and Indicative Enhancement Area (the area covered by the survey is herein referred to as the 'survey area' and shown on **Figure 6, (Annex A)**.
- A desk-based assessment based on aerial imagery of all habitats within the Site using available aerial imagery.

[2] Multi-Agency Geographic Information for the Countryside (MAGIC) website www.magic.gov.uk last accessed 22/11/2023.
[3] Joint Nature Conservation Committee (JNCC) website https://jncc.gov.uk/ last accessed 22/11/2023.
[4] Notable habitats are taken as principal habitats for the conservation of biodiversity listed under Section 7 of the *Environment (Wales) Act 2016*; habitats listed under the Flintshire Biodiversity Action Plan (FBAP); hedgerows identified as being 'important' under the wildlife criteria of the *Hedgerow Regulations 1997*, ancient woodlands and veteran trees.
[5] The 'Main Site' is a term to reflect the CCGT and CCP site including the proposed laydown area, internal access roads, existing utilities connections for welfare use, and the existing Connah's Quay Power Station – refer to Section 1.2 'Definitions' of the EIA Scoping Report
[6] Aspect (2023) Connah's Quay Power Station: Northern Land Parcel: Phase 1 Habitat and Faunal Surveys & Aspect (2023) Connah's Quay Power Station: Southern Land Parcel: Phase 1 Habitat and Faunal Surveys
[7] Aspect (2023) Connah's Quay Power Station: Northern Land Parcel: Breeding, Passage and Wintering Bird Surveys & Aspect (2023) Connah's Quay Power Station: Southern Land Parcel: Breeding, Passage and Wintering Bird Surveys
[8] Aspect (2023) Connah's Quay Power Station: Northern Land Parcel: Reptile Surveys & Aspect (2023) Connah's Quay Power Station: Southern Land Parcel: Reptile Surveys

1.3.2 The purpose of the PEA is to provide a high-level ecological appraisal of the Site in order to inform the Ecological Impact Assessment (EcIA), specifically to:

- identify statutory and non-statutory biodiversity nature conservation designations of potential relevance;
- inform baseline conditions and the presence of Important Ecological Features (IEF) (or those that could be present), based on available information at this stage;
- to identify potential ecological constraints to the Proposed Development and make initial recommendations to avoid impacts on IEFs, as far as reasonably practicable;
- to begin to identify requirements for mitigation, including mitigation measures that will be required and those that may be required (depending on results of further surveys or final Proposed Development design);
- to establish the requirements for more detailed surveys; and,
- to identify any opportunities offered by the Proposed Development to deliver biodiversity enhancements.

1.4 Report Structure

1.4.1 Section 2 sets out the ecological baseline, constraints and recommendations for designated sites, habitats and species. Section 3 summarises the recommendations for further survey work to inform the EcIA.

1.4.2 The following figures are provided to support this PEA in **Annex A** at the end of this report:

- Figure 1 – Site Location Plan;
- Figure 2 – Indicative Site Layout Plan;
- Figure 3 – Statutory Designated Sites within 15 km;
- Figure 4 – Statutory Designated Sites within 2 km;
- Figure 5 – Priority Habitats and Ancient Woodlands; and
- Figure 6 – Indicative UK Habitats.

1.4.3 **Annex B** sets out relevant legislation and planning policy.

1.4.4 The methodology followed for undertaking the desk study and field surveys is detailed in **Annex C**, including any limitations to the assessment.

1.4.5 **Annex D** presents the target notes that inform this PEA and a photographic record.

2. Ecological Baseline, Constraints and Recommendations

2.1 Overview

2.1.1 The following sections detail the results of the desk and field-based studies undertaken to inform this PEA. Where necessary, recommendations for mitigation measures to protect known IEFs, or further surveys to determine the presence or likely absence of likely IEFs, are provided.

2.2 Designated Sites

Desk Study

2.2.1 There are seven Habitat Sites within the study area; one Special Protection Area (SPA) one Ramsar site and five Special Areas of Conservation (SAC). These are detailed in **Table 2-1** below.

2.2.2 There are 35 Sites of Special Scientific Interest (SSSI) within the study area. These are detailed in **Table 2-2** below.

2.2.3 The location of all habitat sites and SSSIs within 15 km can be found on **Figure 3 (Annex A).**

2.2.4 There are no National Nature Reserves (NNRs) within the study area.

2.2.5 There is one local statutory designated site within the study area this is a Local Nature Reserve (LNR): Gathering Grounds Woods & Llywyni Pond LNR, located approximately 1.5 km southeast of the Site which is shown on **Figure 4 (Annex A)**.

Table 2-1 Habitat Sites located within 15 km of the Site

Designated Site	Summary of Citation	Approximate location
The Dee Estuary SPA	Designated for supporting over wintering bird species including: Bar-tailed godwit (*Limosa lapponica*) Black-tailed godwit (*Limosa limosa islandica*) Curlew (*Numenius arquata*) Dunlin (*Calidris alpina alpina*) Grey plover (*Pluvialis squatarola*) Knot (*Calidris canutus*) Oystercatcher (*Haematopus ostralegus*) Pintail (*Anas acuta*) Redshank (*Tringa tetanus*) Shelduck (*Tadorna tadorna*) Teal (*Anas crecca*) The site also supports breeding common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*), as well as supporting on passage sandwich tern (Sterna sandvicensis) and redshank (*Tringa tetanus*). The SPA regularly supports >20,000 waterfowl.	Overlaps with the Proposed Development Site, specifically the Water Connection Corridor.
The Dee Estuary Ramsar	Criteria for its designation include, Wintering and passage waterfowl populations. The estuary supports internationally important numbers of waterfowl and waders. Estuarine and maritime habitats including, mud flats, sand flats and salt marsh. Breeding colonies of natterjack toad (*Epidalea calamita*)	Overlaps with the Site, specifically the Water Connection Corridor.
The River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC	Designated for the presence of the Annex 1 habitat Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-batrachion* vegetation; and its populations of the Annex II species Atlantic salmon *Salmo salar* and floating water-plantain *Luronium natans*. Annex II qualifying features for selection of the site include sea Lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*), brook lamprey (*Lampetra planeri*), otter (*Lutra lutra*), petalwort (*Petalophyllum ralfsii*), and bullhead (*Cottus gobio*).	Located adjacent to the Site
The Dee Estuary / Aber Dyfrdwy SAC	Designated for its mudflat and sandflat habitats, not covered by seawater at low tide: *Saliconia* and other annuals colonising mud and sand; Atlantic salt meadows (*Glauco-Piccinellietalia maritimae*); estuaries; annual vegetation of drift lines; vegetated sea cliffs of the Atlantic and Baltic Coasts; embryonic shifting dunes; shifting dunes along the shoreline; fixed dunes with herbaceous vegetation and humid dune slacks. Annex II qualifying features for selection of the site include sea lampreys (*Petromyzon marinus*) and river lampreys (*Lampetra fluviatillis*) and petalwort (*Petalophyllum ralfsii*).	Overlaps with the Site, specifically the Water Connection Corridor.

Designated Site	Summary of Citation	Approximate location
Deeside and Buckley Newt Sites SAC	Designated for its great crested newt (*Triturus cristatus)* population, one of the largest in Great Britain.	Located approximately 1.5 km south of the Site
Halkyn Mountain / Mynydd Helygain SAC	Designated primarily for the presence of Annex 1 habitats Calaminarian grasslands of the *Violetalia calaminariae*; and Annex II species great crested newt.	Located approximately 3.6 km west of the Site
Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC	Designated primarily for the Annex 1 habitat Tilio-Acerion forests of slopes, screes and ravines; holding one of the largest continuous areas of Tilio-Acerion fores in Wales.	Located approximately 6.8 km to the south-west of the Site

Table 2-2 SSSIs[9] located within 15 km of the Site

Designated Site	Approximate Location
Dee Estuary / Aber Afon Dyfrdwy SSSI	Overlaps with the Site, specifically the Water Connection Corridor
Afon Dyfrdwy (River Dee) SSSI	Located approximately 0.1 km southeast of the Proposed Development Site
Shotton Lagoons and Reedbeds SSSI	Located approximately 0.2 km east from the Proposed Development Site
Mynydd Y Fflint / Flint Mountain SSSI	Located approximately 0.5 km west of the Proposed Development Site
Dee Estuary SSSI	Located approximately 1.3 km north of the Proposed Development Site
Inner Marsh Farm SSSI	Located approximately 1.3 km north of the Proposed Development Site
Connah's Quay Ponds and Woodland SSSI	Located approximately 1.5 km south of the Proposed Development Site.
Comin Helygain a Glaswelltiroedd Treffynnon / Halkyn Common and Holywell Grasslands SSSI	Located approximately 3.6 km west of the Proposed Development Site
Buckley Claypits and Commons SSSI	Located approximately 4 km south of the Proposed Development Site
Maes y Grug SSSI	Located approximately 4 km south of the Proposed Development Site
Hallwood Farm Marl Pit SSSI	Located approximately 6 km north-east of the Proposed Development Site
Herward Smithy SSSI	Located approximately 6.3 km northwest of the Proposed Development Site
Parc Linden, Lixwm SSSI	Located approximately 6.8 km west of the Proposed Development Site
Tyddyn-y-barcut SSSI	Located approximately 6.8 km southwest of the Proposed Development Site
Alyn Valley Woods and Alyn Gorge Caves SSSI	Located approximately 6.8 km southwest of the Proposed Development Site

[9] No online citations available to download.

Designated Site	Approximate Location
Parc Bodlondeb and Gwenallt-parc, Lixwm SSSI	Located approximately 7.2 km west of the Proposed Development Site
Pen-y-Cefn Pasture SSSI	Located approximately 7.5 km southwest of the Proposed Development Site
Cefn Meadow SSSI	Located approximately 7.7 km east of the Proposed Development Site
Chwarel Cambrian / Cambrian Quarry, Gwernymynydd SSSI	Located approximately 9 km southwest of the Proposed Development Site
Dibbinsdale SSSI	Located approximately 9.2 km to the north of the Proposed Development Site
Heswall Dales SSSI	Located approximately 9.8 km to the northwest of the Proposed Development Site
Dee Cliffs SSSI	Located approximately 10.3 km to the northwest of the Proposed Development Site
River Dee (England) SSSI	Located approximately 10.7 km to the southeast of the Proposed Development Site
Ddol Uchaf SSSI	Located approximately 10.7 km west of the Proposed Development Site
The Dungeon SSSI	Located approximately 11.1 km to the northwest of the Proposed Development Site
Mersey Estuary SSSI	Located approximately 11.2 km to the northeast of the Proposed Development Site
Coed Trefraith SSSI	Located approximately 11.6 km northwest of the Proposed Development Site
Coed Talon Marsh SSSI	Located approximately 11.6 km northwest of the Proposed Development Site
Caerwys Tufa SSSI	Located approximately 12 km west of the Proposed Development Site
Bryn Alyn SSSI	Located approximately 12.2 km west of the Proposed Development Site
Thurstaston Common SSSI	Located approximately 12.5 km northwest of the Proposed Development Site
New Ferry SSSI	Located approximately 13.2 km northeast of the Proposed Development Site
Glaswelltiroedd Eryrys (Eryrys Grasslands) SSSI	Located approximately 13.3 km southwest of the Proposed Development Site
Graig, Llanarmon-yn-Ial SSSI	Located approximately 14.5 km southwest of the Proposed Development Site
Chwarel Singret SSSI	Located approximately 14.9 km south of the Proposed Development Site

2.2.6 A review of baseline data carried out by Aspect Ecology (see **Annex E**) identified four Local Wildlife Sites (LWSs) within the study area. The details of these can be found in **Table 2-3** below. It should be noted that this search was only conducted within 2 km of the Main Site and Indicative Enhancement Area of the Proposed Development.

Table 2-3 LWSs located within 2 km of the Site[10]

Designated Site	Approximate Location
Leadbrook Wood LWS	Located approximately 100 m south of the Site
Llwyn-onn LWS	Located approximately 500 m west of the Site
Top-y-fron Dingle and Kelserton Brook LWS	Located approximately 800 m south-east of the Site
Cheshire Farm LWS	Located approximately 1.5 km south of the Site

Constraints and recommendations

2.2.7 As shown in **Table 2-1** and **Table 2-2**, the Site coincides, in part, with a number of Habitat Sites (formerly known as International Sites) and SSSIs and therefore the Proposed Development has the potential to impact them through habitat loss, disturbance and damage.

2.2.8 No local designated sites fall within the footprint of the Proposed Development and therefore LWS are unlikely to be directly impacted.

2.2.9 A Habitat Regulations Assessment (HRA) should be conducted to determine the potential impact of the Proposed Development on these designated sites. Natural England and Natural Resources Wales will be consultees on the HRA Report that will accompany the DCO Application and therefore technical engagement with these parties, where required, in relation to the assessment of impacts and mitigation requirements will form part of the DCO application process to limit the damage to these sites.

2.2.10 An air quality assessment in line with relevant Environmental Permitting Regulations (EPR) 2016 (as amended) guidance[11] should be undertaken to assess the impacts from stack emissions, which may potentially lead to adverse effects on sensitive habitats, including nature conservation designations in the vicinity of the Proposed Development.

2.3 Habitats

Desk Study

2.3.1 The desk study returned a number of areas of priority habitat and approximately 20 areas of ancient woodland within the study area including ancient woodlands, coastal and floodplain grazing marsh, lowland fens and reedbeds, lowland meadows and purple moor grass and rush pastures. The locations of these habitats can be found on **Figure 5 (Annex A).**

2.3.2 **Table 2-4** summarises the records of priority habitats situated within the study area that are within or adjacent to the Site, have habitat links to the Site or are hydrologically connected to the Site.

[10] The Proposed Development Site referenced here, in relation to the Aspect Ecology Report, is based on a previous version of the Site Boundary, which has subsequently been updated. Refer to Site Location Plan 6322/ECO1 within those reports.
[11] Air emissions risk assessment located here: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

Table 2-4 Summary of Notable habitats within the Study Area

Habitat	Reason for Conservation Interest	Location of Habitat[12]
Salt marsh	UK priority habitat	Within the Site
Coastal and floodplain grazing marsh	UK priority habitat	Within the Site
Ancient Semi-natural Woodland	Ancient Woodland	40m southwest of the Site

2.3.3 All areas of recorded ancient woodland within the study area could be impacted by changes to air quality as a result of the Proposed Development.

2.3.4 The habitats identified through available aerial imagery can be found on **Figure 6, (Annex A)**. A brief description of the habitats present in each area of the Site and UK habitat codes can be found below:

- **The Main Site** – The habitats present within the Main Site that were not covered by the field survey consisted of g4 modified grassland, roads (u1b6 800) and industrial buildings (u1b5 817).
- **The Repurposed CO_2 Connection Corridor** – The habitats present along the Repurposed CO_2 Connection Corridor appear from aerial imagery to be largely pastureland for animals intersected with hedgerows. The pasture is assumed to be g4 modified grassland and the hedgerows that are present throughout the corridor are assumed to be h2a native hedgerow, some of which have trees present within them. Additionally, there are areas of urban gardens (u1d).
- **The Proposed CO_2 Connection Corridor** – This area of the Site is made up of two fields (the northern field appears to be cropland c1c and southern field appears to be g4 modified grassland) separated by hedgerow (assumed to be h2a native hedgerow) and bordered to the north and west by hedges (assumed to be h2a native hedgerow) and roads (u1b6 800) and to the east by a strip of broadleaved woodland (w1f lowland mixed deciduous woodland) and a stream (r2b – Other rivers and streams).
- **Existing Natural Gas Connection Corridor** – This area of the Site crosses salt marsh (t2a-coastal salt marsh) the River Dee estuary (r2a – Rivers) areas of grassland (assumed to be g3c other neutral grassland) woodland associated with the verges of the A548 (w1f lowland mixed deciduous woodland) and roads (u1b6 800).
- **Water Connection Corridor –** This area of the Site crosses salt marsh (t2a – coastal salt marsh) and the River Dee estuary (r2a – Rivers).

Field Survey

2.3.5 Summary descriptions of the habitats within the survey area are provided below and shown on **Figure 5 (Annex A)**, with specific features highlighted by target notes (TNs). TN descriptions and photographs are provided in **Annex D**.

[12] Where features are situated outside of the Site boundary, the distance and direction is given at the closest point of the designated site from the Site

g3c- Other Neutral Grassland

2.3.6 Large areas of the survey area were made up of grassland habitats. As the field survey was conducted in November, it was not possible to identify these areas further as many herb and grass species would have died back and would no longer be present. Species present at the time of survey included musk thistle (*Carduus nutans*), common nettle (*Urtica dioica*), perennial rye grass (*Lolium perenne*), red fescue (*Festuca rubra*) and creeping thistle (*Cirsium arvense*).

w1f7 29 – Other Lowland mixed deciduous woodland Plantation

2.3.7 Two strips of young (<30 years) plantation woodland (TN1 & TN2). Made up of a mix of tree species including silver birch (*Betula pendula*), ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*), goat willow (*Salix caprea*) and hawthorn (*Crataegus monogyna*).

h3d – Bramble Scrub

2.3.8 Several areas of dense scrub were located throughout the survey area. These were dominated by bramble (*Rubus fruticosus* agg).

u1b5 817 – Buildings Industrial

2.3.9 Buildings making up the existing Connah's Quay Power Station.

u1b6 800- Developed land; sealed surface - other developed land – road

2.3.10 Roads and other asphalt surfaces that make up the existing Connah's Quay Power Station.

g1c – bracken

2.3.11 Strip of bracken to the east of the Site (TN8).

u1f 80 – Sparsely vegetated urban land – possible Open mosaic habitat on previously developed land

2.3.12 An area of possible open mosaic habitat (OMH) on previously developed land (TN9). Species included buddleia (*Buddleja davidii*) and thyme sp. The plants present within this area were largely dead or had gone over at the time of survey. There were a mixture of tracks (some of which were remnant asphalt, some concrete and some compacted crushed aggregate in places) and some of what appeared to be raised foundations of old buildings all supporting more or less vegetation. Grasses were more abundant in places and buddleia was more abundant towards the Main Site, but there was also evidence of management by cutting in some areas. Potentially an area of priority habitat.

g3c 81- Other Neutral Grassland – ruderal ephemeral

2.3.13 There were pockets of tall ruderal vegetation dominated by nettle with umbellifers and willowherb species (*Epilobium sp.*) present (TN3) within the survey area.

g4 – modified grassland

2.3.14 Areas of amenity grassland making up parts of the existing Connah's Quay Power Station. These were located around reception and west of the main plant area and were dominated by perrenial rye grass with daisy *Bellis perrenis* and dandelion *Taraxacum* sp.

r1g 42 – Other Standing Water Ponds

2.3.15 Three large ponds (approximate sizes of which are: 2,990 m^2, 9,980 m^2 and 2,560 m^2) indicated by Target Note 4 in **Figure 6, Annex A**. Two of these were located to the north-east of the survey area and the third is located partially within the survey area.

Constraints and Recommendations

2.3.16 The field survey was conducted in November so many plant species would not have been present at the time of survey. Detailed botanical surveys should be conducted in the spring and summer to determine the quality of habitats on site such as grassland, sparsely vegetated urban land, salt marsh and hedgerows. These surveys to inform the baseline will be the 'right' standard to allow a habitat condition assessment to be undertaken to inform Net Biodiversity Benefit (NBB).

2.3.17 It is recommended that construction methodology avoids impacts to any priority habitats, such as rivers, salt marsh and possible OMH. Salt marsh represents an irreplaceable habitat and its loss cannot be mitigated or compensated. It is also recommended that semi-natural habitats such as scrub, woodland and grassland should be retained and protected, as far as reasonably practicable. Where habitat loss cannot be avoided, it should be the minimum required and habitat replacement proposed as compensation.

2.3.18 If there is to be any habitat loss in areas where habitats have only been identified by aerial survey, then botanical surveys should be undertaken to 'ground truth' the aerial survey information.

2.3.19 The remaining habitats within the Site are considered to be common and widespread and any loss to them will be compensated by habitat creation being undertaken to ensure the Proposed Development does not result in a loss of biodiversity, but instead results in a biodiversity net benefit.

2.4 Bats

Desk Study

2.4.1 Surveys conducted by Aspect Ecology (see **Annex E**) identified areas of suitable habitat for foraging and commuting bats within the Indicative Enhancement Area. These habitats included rough grassland, scrub, and a line of trees.

2.4.2 These suitable habitats areas were also present within the Main Site area of the Proposed Development; however, it was determined that the lighting from the existing Connah's Quay Power Station and town of Connah's Quay may reduce the suitability of these habitats for roosting bats.

2.4.3 There is habitat connectivity to the surrounding landscape to the Site through the railway corridor that runs along the southern boundary of the Main Site and the River Dee estuary to the north of the Site.

2.4.4 Several trees that are large enough to support potential bat features have been identified both within the survey area and within the areas surveyed by aerial imagery. These were located in the hedgerows and areas of woodland in the Repurposed CO_2 Connection Corridor and the Proposed CO_2 Connection Corridor.

Field Survey

2.4.5 The habitats on Site provide potential flightpaths and foraging habitats, as there are grassland, scrub, woodland and wetland habitats present, and the Site has habitat connections to the wider landscape.

2.4.6 The field survey identified trees with potential to support features suitable for roosting bats within the Indicative Enhancement Area and south of the survey area along the access road to the existing Connah's Quay Power Station.

2.4.7 The buildings that make up the existing Connah's Quay Power Station may offer potential to support features for roosting bats although they are illuminated and largely subject to levels of existing industrial noise and regular disturbance and so are unlikely to support significant roosts.

Constraints and Recommendations

2.4.8 The habitats on Site are considered to be of moderate value as potential flightpaths and foraging habitats, therefore activity surveys need to be undertaken to determine the potential impacts of the Proposed Development on foraging and commuting bats. Night bat walkover surveys should be carried out across all habitats suitable for bats coupled with automatic detector surveys to identify important commuting features or activity hotspots.

2.4.9 A number of trees with the potential to support features suitable for roosting bats were identified both in the Indicative Enhancement Area and the Proposed/Repurposed CO_2 Connection Corridor. If these trees are likely to be directly impacted by the Proposed Development, then the classification of the bat roost suitability of affected trees within these areas should be determined at the earliest stage possible using current survey guidelines[13]. This would be done by undertaking an initial ground level Preliminary Roost Assessment (PRA) of the tree followed by a detailed Potential Roost Features (PRF) aerial inspection survey (if deemed to be required and where safe to do so), to establish all PRFs found on each tree. The result of the PRA / PRF aerial inspection survey will give a roost suitability rating (PRF-Individual or PRF-Multiple) and may also establish the presence/absence of roosting bats within the tree.

2.4.10 The buildings that make up the existing Connah's Quay Power Station may offer suitable features for roosting bats. The classification of the bat roost suitability of structures within the Proposed Development will be required

[13] Collins, J.(ed) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conversation Trust. London.

where an impact to a structure will occur, to determine further survey requirements. This requirement would be assessed as the design of the Proposed Development is established and progressed. If an impact to a structure is required, a detailed PRA would be undertaken, to establish all PRFs at the earliest stage possible using current survey guidelines[14]. The result of the PRA will give a roost suitability rating of each structure (from Negligible to High), which in turn will inform the number of emergence surveys required to establish the presence/absence of roosting bats within each structure.

2.4.11 These surveys will enable appropriate avoidance /mitigation measures to be developed for the physical works associated with the Proposed Development. Works affecting a bat roost would need to be completed under a Natural Resources Wales European Protected Species mitigation licence. The licence would detail the appropriate mitigation and compensation measures necessary to maintain the Favourable Conservation Status of bats. Mitigation measures would include, for example, the appropriate timing and supervision of works, and compensation would include the provision of replacement roosting habitat.

2.5 Badger

Desk Study

2.5.1 The initial survey work conducted by Aspect Ecology (see **Annex E**) found that habitats within the Site were suitable for use by badger (*Meles meles*) for foraging and sett building, including scrub, tall ruderal vegetation, and grassland. Targeted badger surveys undertaken by Aspect Ecology found no setts present, but there was evidence of badger using the Site such as areas of foraging and badger paths.

2.5.2 Habitats were identified throughout the whole site through aerial imagery as being suitable for badger, and these included woodland, grassland and hedgerows.

Field Survey

2.5.3 Habitats were found to be present within the survey area that are suitable for foraging and sett building, including grassland, woodland, scrub, and ruderal habitats.

2.5.4 No badger setts were found during the field surveys.

Constraints and Recommendations

2.5.5 The desk study identified habitats within the Site with suitability for badger and evidence of badger use of the Site through field survey although determined no setts were present.

2.5.6 The updated field surveys confirmed the habitats were suitable to support badger foraging and sett building although no evidence of recent badger activity was recorded. Therefore, it is recommended that a full badger survey

[14] Collins, J.(ed) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conversation Trust. London.

is conducted within the Site and a 30 m buffer to determine if there are any badger setts present that could be impacted by the Proposed Development.

2.5.7 Where active badgers or their setts may be impacted by the Proposed Development, then a licence may be required from Natural Resources Wales. Badger licences permit the closure of setts in the period 01 July to 30 November. Where high-status badgers' setts are impacted then it may be necessary to provide a replacement sett.

2.6 Otter

Desk Study

2.6.1 The initial Aspect Ecology survey work (see **Annex E**) identified the Dee Estuary as highly suitable for foraging and commuting otter (*Lutra lutra*)[15]. This determined the habitats within the area surveyed were unsuitable for otter.

2.6.2 The aerial image search identified corridors with woodland and streams present within the Proposed CO_2 Connection Corridor and the salt marsh habitats and River Dee to the north of the survey area that could provide suitable otter habitat for foraging commuting and resting.

Field Survey

2.6.3 No evidence of otter was recorded during the field survey. The majority of the survey area was of limited suitability for otter, comprising of open and exposed habitats that offer limited shelter for otter. The habitats associated with the River Dee provide a suitable foraging and commuting route for otter, although the tidal character limits opportunities for shelter or breeding. Some potential opportunities for shelter may be provided by pipes that lead from the existing Connah's Quay Power Station into to the River.

Constraints and Recommendations

2.6.4 Otters are a widespread species that are likely to be present on most watercourses in lowland Wales. Operations affecting watercourses or suitable terrestrial habitat are likely to impact this species, with locations representing breeding sites being most sensitive. It is recommended that as the design of the Proposed Development is established and progressed, and any affected watercourses and potential terrestrial habitat suitable for otters are identified and the potential for impacts reviewed. Further detailed surveys including monitoring may then be required to determine the likely presence of breeding sites.

2.6.5 In the event that impacts to otters are identified then best practice avoidance measures or a Natural Resources Wales European Protected Species mitigation licence may be required. If required, the mitigation licence would include the measures necessary to maintain the Favourable Conservation Status of otter, including the appropriate timing of works and provision of replacement habitat.

[15] Aspect Ecology (2023) Connah's Quay Power Station: Northern Land Parcel Phase 1 Habitat and Faunal Survey & Aspect Ecology (2023) Connah's Quay Power Station: Southern Land Parcel Phase 1 Habitat and Faunal Survey

2.7 Water Vole

Desk Study

2.7.1 The initial survey work undertaken by Aspect Ecology (see **Annex E**) determined that water vole (*Arvicola amphibius*) were not detected within any habitats that make up the Site or its immediate surroundings.

2.7.2 The aerial image search identified a stream within the Proposed CO_2 Connection Corridor that could offer suitable habitat to water vole.

Field Survey

2.7.3 Habitats were found to be present within the survey area that are suitable for water vole, including ponds and salt marsh.

Constraints and Recommendations

2.7.4 Previous survey determined that water vole were likely absent from the Site and its immediate surroundings. However, the surveys undertaken were not in line with best practice guidance, with individual surveys being completed in 2021 and 2023; therefore, it is not possible to conclude that water vole are absent.

2.7.5 A stream is also located within the Proposed CO_2 Connection Corridor that could offer suitable habitat to water vole and the updated field surveys identified that the three ponds to the north-east of the Site also provide suitable habitat.

2.7.6 It is recommended that if these habitats are likely to be directly impacted by the works (if construction works are going to come within 5m of any of these waterbodies) then further surveys would be required to determine if water vole are present.

2.7.7 Surveys should involve a habitat suitability assessment for water vole of all waterbodies to be directly impacted by the Proposed Development followed by two survey visits of all suitable waterbodies, one in Spring (mid-April to June) and one in Summer (July-September) to determine water vole presence and population size and the impact the Proposed Development will have on them.

2.7.8 If water vole are likely to be impacted, then a Natural Resources Wales species licence would be required. The licence would detail the appropriate timing and supervision of works, including measures to displace water vole from the working area. Displacement may involve the management off vegetation and / or the use of exclusion fencing and trapping during the appropriate time of year. Subject to the level of impact this may include a requirement to provide suitable replacement habitat.

2.8 Great crested newt

Desk Study

2.8.1 The initial survey work undertaken by Aspect Ecology (see **Annex E**) determined that great crested newt (*Triturus cristatus*) were not present within any habitats that make up the Site or its immediate surroundings.

Field Survey

2.8.2 Three ponds with potential to support great crested newt were identified within 50m of the Site.

2.8.3 There are also terrestrial habitats present suitable for great crested newt such as grassland, scrub, woodland, ruderal habitat and hedgerows. The railway line that runs along the southern boundary of the Main Site area offers habitat connections to the surrounding area, along with the hedgerows that connect to the wider landscape.

Constraints and Recommendations

2.8.4 The Proposed Development has the potential to impact great crested newts if they are present within habitats within the Site. It is recommended that a desk study is undertaken to identify all ponds within 500m of the Site boundary.

2.8.5 All ponds identified by the desk study should be subject to a habitat suitability assessment for great crested newt and eDNA survey (undertaken between mid-April and June) to determine if great crested newts are present.

2.8.6 If the eDNA surveys return a positive result for great crested newts then population class estimate surveys will need to be undertaken to determine the size of great crested newt populations present and therefore to inform the Proposed Development's potential impact on this species.

2.8.7 If great crested newts are impacted, then a Natural Resources Wales European Protected Species mitigation licence may be required. The mitigation licence would include the measures necessary to maintain the favourable Conservation Status of great crested newt, including the appropriate timing of works and provision of replacement habitat.

2.9 Reptiles

2.9.1 Common species of reptile refers to common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix helvetica*).

Desk Study

2.9.2 Reptile surveys conducted by Aspect Ecology in 2022 (see **Annex E**)[16] determined that a low population of common lizard were present within the

[16] Aspect Ecology (2023) Connah's Quay Power Station: Northern Land Parcel: Reptile Surveys & Aspect Ecology (2023) Connah's Quay Power Station: Southern Land Parcel: Reptile Surveys

Site (present within the Indicative Enhancement Area). Surveys throughout the rest of the Site found reptiles to be absent.

Field Survey

2.9.3 The habitats suitable for reptiles present within the Survey Area were found to be largely unchanged since the initial reptile surveys conducted by Aspect in 2022 and there is potential for small numbers of common reptiles to be present across the survey area focused on areas of less managed habitat.

Constraints and Recommendations

2.9.4 A low population of common lizard is present within the Site boundary.

2.9.5 Where possible, the Proposed Development should be designed to avoid suitable reptile habitat where there is a risk of harm to reptiles. Where this is not possible then construction works within areas of suitable reptile habitat should implement precautionary working methods and standard practice mitigation measures to manage the risk to reptiles. In addition to the avoidance of suitable hibernation habitat in the reptile hibernation period (mid-October to mid-March), mitigation measures may also involve measures to displace reptiles into areas of retained or created habitat. This would be undertaken during suitable weather conditions in the reptile active period (mid-March to mid-October, inclusive), and involves the sensitive management of vegetation and / or the capture of reptiles.

2.10 Birds

Desk Study

2.10.1 The Dee Estuary SPA, SSSI and Ramsar sites are all designated due to the important assemblage of bird species.

2.10.2 The initial survey work undertaken by Aspect Ecology (see **Annex E**)[17] found that '*Two of the four Annex 1 species relevant to the SPA/Ramsar site were recorded in significant numbers in the estuary adjacent to the site*' and '*Of the qualifying migratory species, seven were recorded in the estuary in significant numbers*'.

2.10.3 The aerial image search identified habitats suitable for bird species including woodland, grassland, salt marsh, hedgerows and the River Dee.

Field Survey

2.10.4 Grassland and wetland habitats within the survey area were suitable for birds, including wading birds. Buildings and woody vegetation also provided suitable nesting habitat for widespread bird species.

2.10.5 Large numbers of foraging curlew (*Numenius arquata*) were present within these habitats at the time of the field surveys.

[17] Aspect Ecology (2023) Connah's Quay Power Station: Northern Land Parcel Breeding, Passage and Wintering Bird Surveys & Aspect Ecology (2023) Connah's Quay Power Station: Southern Land Parcel Breeding, Passage and Wintering Bird Surveys

Constraints and Recommendations

2.10.6 The Dee Estuary SPA, SSSI and Ramsar sites coincide partly with the Site and construction works have the potential to impact the assemblage of bird species they are designated for.

2.10.7 Habitats within the survey area were found to support large assemblages of wading birds at the time of the field survey. Therefore, further survey is proposed to determine the impacts of the Proposed Development on these bird assemblages.

2.10.8 Breeding bird surveys should comprise up to six survey visits over the period March to July, inclusive. Transects would record bird sound and behavior to classify the breeding status of birds present. The locations of all species of conservation importance that are breeding or likely to breed would be mapped and an estimate of their numbers (pairs/territories) derived. These breeding bird survey visits should also comprise wader surveys to identify the presence of any breeding wader species either within the Site or the adjacent intertidal and salt marsh habitat. These are targeted surveys that would monitor the most suitable habitats for waders in these locations.

2.10.9 Wintering and passage bird survey will be completed over a 12-month period. The surveys would be timed to take place at the appropriate high and low water periods to cover the spring and neap tides, with nocturnal monitoring also included.

2.10.10 These surveys will inform what avoidance/mitigation and compensation measures need to be put in place to ensure that the Proposed Development will not impact the Favorable Conservation Status of birds in the area and to minimize impacts of the Proposed Development on the assemblages of birds that use the nearby protected sites.

2.11 Terrestrial Invertebrates

Desk Study

2.11.1 The initial survey work undertaken by Aspect Ecology (see **Annex E**)[18] scoped out invertebrates as a constraint to the Proposed Development stating '*site contains relatively few micro-habitats that would typically indicate elevated potential for invertebrates*'.

Field Survey

2.11.2 There are habitats suitable for terrestrial invertebrates throughout the survey area including sparsely vegetated urban land, grassland, woodland, hedgerows, and ruderal habitats. These habitats in a mosaic can offer opportunities for terrestrial invertebrates.

[18] Aspect Ecology (2023) Connah's Quay Power Station: Northern Land Parcel Phase 1 Habitat and Faunal Survey & Aspect Ecology (2023) Connah's Quay Power Station: Southern Land Parcel Phase 1 Habitat and Faunal Survey

Constraints and Recommendations

2.11.3 Suitable habitat for terrestrial invertebrates are present within the Site and so there is a potential that they could be impacted by the Proposed Development.

2.11.4 It is recommended that further surveys are carried out. The scope of these would be confirmed following the review of third-party data and a scoping walkover of the Site by an entomologist, targeted on habitats suitable for terrestrial invertebrates, such as OMH.

2.12 Natterjack Toad

Desk Study

2.12.1 Natterjack toad (*Epidalea calamita*) have been reintroduced along the Dee Estuary[19] through the Natterjack Reintroduction Project.

Field Survey

2.12.2 Three ponds with potential to support natterjack toad were identified within the survey area.

2.12.3 There are also terrestrial habitats present suitable for natterjack toad such as salt marsh, scrub and ruderal habitat.

Constraints and Recommendations

2.12.4 It is not known if the reintroduction of natterjack toad along the Dee Estuary is in close enough proximity to the Proposed Development for it to impact this species.

2.12.5 It is recommended that a further desk study is undertaken to determine the current range of this species and if further survey is needed.

2.13 Hazel Dormouse

Desk Study

2.13.1 The initial survey work conducted by Aspect Ecology (see **Annex E**)[20] scoped out Hazel dormouse (*Muscardinus avellanarius*) as a constraint to the Proposed Development stating '*the site is close to the limits of the known UK distribution of this species. Habitats present provide very limited opportunities for Dormouse*'.

Field Survey

2.13.2 The habitats present within the survey area provide very little opportunity for dormouse lacking the variety of food plants required for this species or the vegetation structure required.

[19] Natterjacks in North Wales Available here: https://www.arc-trust.org/natterjacks-in-north-wales last accessed 24/11/2023
[20] Aspect Ecology (2023) Connah's Quay Power Station: Northern Land Parcel Phase 1 Habitat and Faunal Survey & Aspect Ecology (2023) Connah's Quay Power Station: Southern Land Parcel Phase 1 Habitat and Faunal Survey

2.13.3 There is very limited habitat connection from the Proposed Development to any potential areas of suitable dormouse habitat in the surrounding landscape.

Constraints and Recommendations

2.13.4 The lack of suitable habitat within the Site and the lack of suitable connections to any potential habitat in the surrounding landscape means dormouse are very unlikely to be present within the Site and so are unlikely to be impacted by the Proposed Development.

2.13.5 This species is proposed to be scoped out of any further assessment.

3. Recommendations for Further Survey

3.1.1 The following further surveys, summarised in **Table 3-1**, are recommended.

Table 3-1 Recommendations for Further Survey

Survey	Scope	Survey Timing	Survey Extents
Preliminary Ecological Appraisal (PEA) including UKHab survey and habitat condition assessment to inform NBB	A PEA including UKHab survey and habitat condition assessment will be carried out during the optimal survey season based on the following methodology: UKHab Classification[21], Natural England Statutory Biodiversity Metric[22], and CIEEM PEA Guidance. Hedgerows within the Site would be surveyed against the landscape and wildlife important hedgerow criteria of the Hedgerow Regulations 1997. The survey will also reaffirm the potential habitats to support protected and/or notable fauna, including protected species, Species of Principal Importance (SOPI) and Local Biodiversity Action Plan species, specifically in association with the Proposed CO_2 Connection Corridor.	April - September 2024	Accessible terrestrial habitats within the Site plus up to 50 m (where accessible).
Botanical survey including National Vegetation Classification (NVC) surveys	Detailed NVC of the saltmarsh and sparsely vegetated urban land (possible OMH), will be completed in accordance with Rodwell (2006)[23].	May - July 2024	Accessible terrestrial habitats within the Site, specifically the Main Site, Water Connection Corridor, and Indicative Enhancement Area. Further surveys in association with the Proposed CO_2 Connection Corridor are to be confirmed following the PEA.
Wetland bird surveys	Year-round waterbird surveys over a 12-month period with a minimum of three visits per month, following modified Wetland Bird (WeBS) methodology[24]	November 2023-	All land within the Site (specifically, the Main Site including the Water Connection

[21] UKHab Ltd (2023), UK Habitat Classification Version 2.0. Available at: https://www.ukhab.org.
[22] Defra (2023) Statutory Biodiversity Metric Tool. Available at: https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides
[23] Rodwell, J.S. (2006) *National Vegetation Classification User's Handbook*. Joint Nature Conservation Committee, Peterborough
[24] British Trust for Ornithology, 2023; Wetland Bird Survey. Available at: https://www.bto.org/our-science/projects/wetland-bird-survey

Survey	Scope	Survey Timing	Survey Extents
	utilising point and sector counts across various tidal states. The surveys will be timed to take place at the appropriate high and low water periods to cover the spring neap tides. Each month these survey visits would include a nocturnal survey visit. The survey techniques in each month would comprise a combination of walked transects and monitoring of key habitats, including the use of spotting scopes and thermal imaging cameras to record birds at night.	October 2024	Corridor, Proposed CO_2 Connection Corridor, and Indicative Enhancement Area) and study area of estuary and saltmarsh habitats up to 1.5 km (as visibility allows).
Breeding bird surveys	Common Bird Census (CBC) methodology[25] of all terrestrial parts of the Site and surrounding saltmarsh habitats. The survey will comprise 5 monthly visits March to July, inclusive. The survey in each month would comprise a walked transect. An additional four visits April to June will also be conducted to identify the presence of any breeding wader species within the Site or intertidal habitats. These are target surveys, in addition to the wetland surveys, to monitor the most suitable habitats for waders in these locations. Approximate bird territories will be extrapolated from the survey data in accordance with the territory mapping methods based on Gilbert et al (1998)[26].	March 2024-July 2024 (one visit per month for five months); and April 2024 to June 2024 (an additional four visits)	All land within the Site (specifically, the Main Site including the Water Connection Corridor, Proposed CO_2 Connection Corridor, and Indicative Enhancement Area) and study area of estuary and saltmarsh habitats up to 1.5 km (as visibility allows).
Great crested newt habitat suitability assessments including environmental DNA	A great crested newt habitat suitability index (HSI) will be completed at ponds on and within 500 m of the Site (where applicable). The HSI assessment will evaluate the suitability of accessible ponds for great crested newt based on methodology of Oldham et al (2000)[27]. Water samples will also be taken from accessible ponds in accordance with the method of Briggs et al (2014) and analysed for great crested newt environmental DNA (eDNA) at a laboratory approved by Natural Resource Wales. Further great crested newt population size class assessment survey may be required, depending on the results of the eDNA survey.	15th April to end of June 2024	Ponds within the Site (Main Site including Water connection Corridor, Proposed CO_2 Connection Corridor, and Indicative Enhancement Area) plus up to 500 m where applicable.

[25] Marchant, J. H, 1983; Common Birds Census instructions. British Trust for Ornithology, Tring.
[26] Gilbert, G., Gibbon, D. W. and Evans, J.,1998; Bird Monitoring Methods – a manual of techniques for key UK species. RSPB, Sandy.
[27] Oldham, R.S. & Keeble, J. & Swan, M.J.S. & Jeffcote, M., 2000; Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal. 10. 143-155

Survey	Scope	Survey Timing	Survey Extents
Potentially natterjack surveys	Natterjack toads were introduced along the Dee Estuary through the Natterjack Reintroduction Project. Saltmarsh habitat within the Site may potentially offer opportunities for natterjack toads, particularly any shallow pools of water and coastal habitat. Scope and requirement for surveys is to be confirmed upon review of third-party desk study data and potential impacts to suitable habitat.	April - September[28]	If required, potentially ponds and salt marsh habitat within the Site, specifically the Main Site including Water Connection Corridor, and Indicative Ecological Enhancement Area.
Bats – Preliminary Roost Assessment (PRA)	Some buildings within the Site, specifically the Main Site comprising the Gas Treatment Plant, and Contractor Facilities are potentially proposed to be demolished, which may offer potential suitability to support roosting bats. Additionally, buildings to be retained may have potential for roosting bats and be indirectly impacted by the Proposed Development, for example the Above Ground Installation (AGI). Trees with within the Indicative Enhancement Area and along the access road to the power station have potential suitability to support roosting bats. A detailed daytime bat walkover will be carried out of the Site, comprising a PRA. The methodology will follow the Bat Conservation Trust (BCT) Good Practice Guidelines[29]. Further bat roost presence / absence surveys and hibernation to be confirmed following the PRA.	Any time of year	PRA of buildings and trees within the Site and up to 50 m, specifically the Main Site, Indicative Enhancement Area and *potentially* the Proposed CO_2 Connection Corridor.
Bats – Foraging and Commuting	The habitats within the Site, specifically the Main Site including Water Connection Corridor, Indicative Enhancement Area, and potentially the Proposed CO_2 Connection Corridor (to be confirmed) are assessed as moderate suitability for foraging and commuting bats e.g., grassland, scrub, woodland, wetland habitats and hedgerows.	April to October 2024	A night-time walkover of the Site to include walked transects three times per active season augmented with use of static detectors recording for five nights per season, Specifically the Main Site including Water Connection Corridor, Indicative Enhancement Area, and *potentially* the

[28] Martin, Y et., al; 2021: Guidance for monitoring natterjack toad populations in the United Kingdom. Natterjack Toad Species Recovery Programme. Amphibian and Reptile Conservation. Available at: https://www.arc-trust.org/Handlers/Download.ashx?IDMF=e9980a11-c175-42f1-8374-df06f5de97d2
[29] Bat Conservation Trust, 2023; Bat Surveys for Professional Ecologists Good Practice Guidelines. 4th edition. The Bat Conservation Trust, London.

Survey	Scope	Survey Timing	Survey Extents
	A night-time walkover will be carried out based upon BCT Guidelines (2023)[30]. This comprises one survey visit per season (spring – April/May; summer – June/July/August; autumn – September/October). Additionally, automated / static bat detector surveys will be carried out, with data to be collected for a minimum of five consecutive nights per month (April to October) in appropriate (or the best available) weather conditions for bats. Detector locations would aim to provide a representative sample of all habitats in the Site that could be impacted by construction or operation activities.		Proposed CO_2 Connection Corridor (to be confirmed). Targeted habitats would be identified for the automated / static detector locations within the Site based on a representative sample of those habitats to be impacted (directly or indirectly) by construction or operation.
Badger	A badger survey will be carried out of the Site plus adjacent areas (where possible). Habitats found within the Site were identified as suitable for foraging and sett building specifically the woodland, scrub, grassland and tall ruderal habitat. Survey methodology will follow best practice guidelines (Harris et al. 1989[31]; and Badger Trust, 2023[32]).	Anytime of year	The Site (excluding the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor), plus up to 30 m study area (where accessible).
Otter	Otter survey of the Site and adjacent areas, with potential suitable terrestrial habitat to support otter e.g., the River Dee. The otter survey will be completed in accordance with best practice guidance (Chanin, 2023[33], Ward 1994[34], and Lenton et al, 1980[35]).	Any time of year	The Site, focused on the River Dee and adjacent habitat within the Site, extending up to 200 m up and downstream (where applicable).
Water Vole	Water vole survey of the Site and adjacent areas, with potentialsuitable habitat to support otter and water vole e.g., ponds within the Site. The water vole survey will be completed in accordance with bestpractice guidance (Dean et al, 2016[36]).	Mid-April to end of June 2024 (survey one) July to end of September	The Site, focused on the waterbodies within the Site.

[30] Bat Conservation Trust, 2023; Bat Surveys for Professional Ecologists Good Practice Guidelines. 4th edition. The Bat Conservation Trust, London.
[31] Harris, S. Cresswell, P. and Jefferies, D., 1989; Surveying Badgers.
[32] Badger Trust, 2023; Badger Protection: Best Practice Guidance for Developers, Ecologists and Planners (Wales)
[33] Chanin, P. (2003) Monitoring the Otter. Conserving Natura 2000 Rivers. Monitoring Series No. 10. English Nature, Peterborough
[34] Ward D, Holmes N and José P, 1994; The New Rivers and Wildlife Handbook. RSPB, Bedfordshire
[35] Lenton, E.J., Chanin, P.R.F. and Jefferies, D.J., 1980; Otter Survey of England 1977-79. Nature Conservancy Council, London
[36] Dean, M. Strachan, R. Gow, D. Andrews, R., 2016; The Water Vole Mitigation Handbook (The Mammal Society Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society. London.

Survey	Scope	Survey Timing	Survey Extents
		2024 (survey two)	
Terrestrial invertebrates	Terrestrial invertebrate survey scope is to be confirmed following review of third-party data and scoping walkover by an entomologist. Targeted on habitats suitable for terrestrial invertebrates including OMH.	April - September	The Site (excluding the Repurposed CO_2 Connection Corridor and Existing Natural Gas Connection Corridor).

Annex A Figures

Figure 1 Site Location Plan
Figure 2 Indicative Site Layout Plan
Figure 3 Habitat Sites and National Designated Sites within 15km
Figure 4 National Local Designated Sites within 2km
Figure 5 Priority Habitats and Ancient Woodlands within 2km
Figure 6 Indicative UK Habitats

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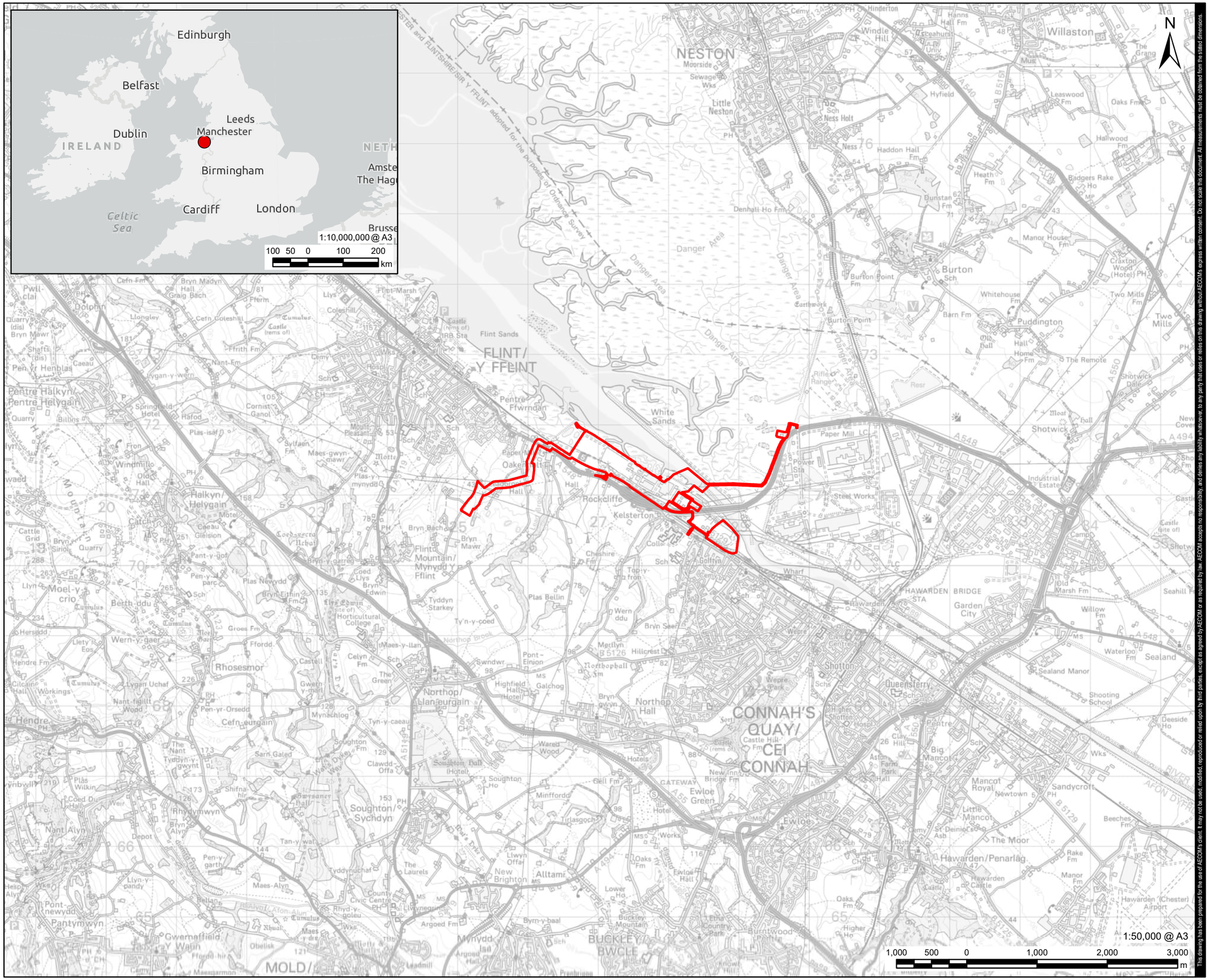

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LEGEND

Indicative Site Boundary

NOTES

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Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

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FIGURE TITLE

Site Location Plan

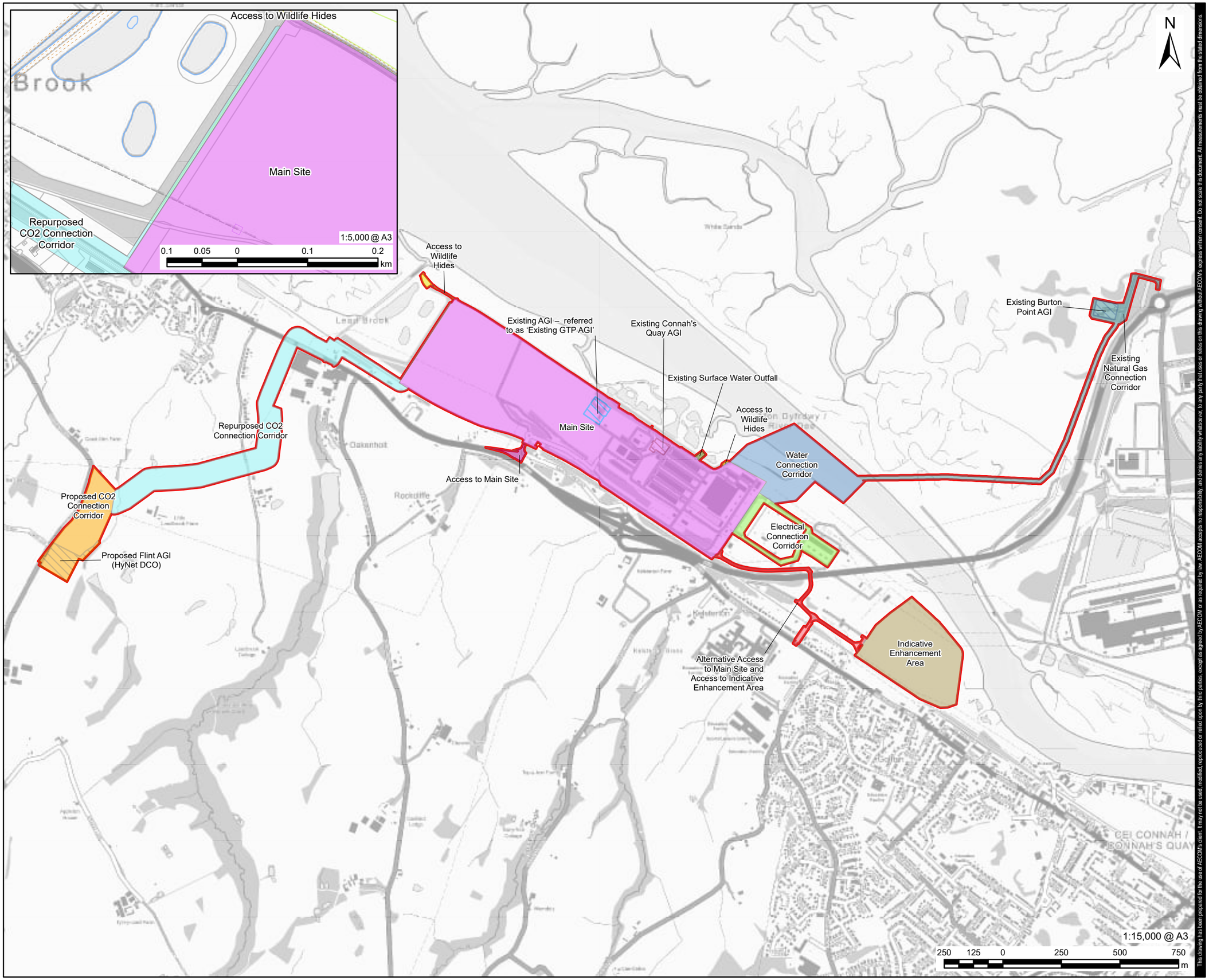
FIGURE NUMBER

Figure 1

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuayPowerandCCS\900_CAD_GIS\920_GIS\02_Maps\PEARCO_PEA_Fig1_SiteLocationPlan_20240122_01.aprx

Revision: 0 Drawn: JG Checked: AB Approved: FH Date: 2024-01-30

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\Powerand\CCS\900_CAD_GIS\920_GIS\02_Maps\Scoping Report\CO_SCO_Fig1_3_IndicativeDCOSiteLayout_20240130_01.aprx



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LEGEND

- Indicative Site Boundary
- Access to Main Site
- Access to Wildlife Hides
- Alternative Access to Main Site and Access to Indicative Enhancement Area
- Electrical Connection Corridor
- Repurposed CO2 Connection
- Existing AGI – referred to as 'Existing GTP AGI'
- Existing Surface Water Outfall
- Indicative Enhancement Area
- Main Site
- Existing Connah's Quay AGI
- Proposed CO2 Connection Corridor
- Proposed Flint AGI (HyNet DCO)
- Water Connection Corridor
- Existing Natural Gas Connection Corridor
- Existing Burton Point AGI

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The Indicative Enhancement Area is under consideration to be used for mitigation or enhancement (planting), but this does not represent a formal commitment of the Applicant at this stage of design.

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PROJECT NUMBER

60717119

FIGURE TITLE

Indicative DCO Site Layout

FIGURE NUMBER

Figure 2

Revision: 0 Drawn: JG Checked: AB Approved: JC Date: 2024-01-30

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\PowerandCCS\900_CAD_GIS\920_GIS\02_Maps\Scoping Report\CQ_SCO_Fig9-1_HabitatSitesNationalDesignatedSites15km_20240130_01.aprx

Liverpool Bay / Bae Lerpwl (Wales) (SPA)
Red Rocks
Gronant Dunes and Talacre Warren (SSSI)
Prestatyn Hillside (SSSI)
Teilia Quarry (SSSI)
Moel Hiraddug a Bryn Gop (SSSI)
Glaswelltiroedd Trelogan / Trelogan Grasslands (SSSI)
Graig Fawr (SSSI)
Maes Hiraddug (SSSI)
Hendre Bach (SSSI)
Mwyngloddfa Pennant (SSSI)
Ffynnon Beuno and Cae Gwyn Caves (SSSI)
Coed Trefraith (SSSI)
Caerwys Tufa (SSSI)
Ddol Uchaf (SSSI)
Parc Linden, Lixwm (SSSI)
Herward Smithy (SSSI)
Halkyn Mountain / Mynydd Helygain (SAC)
Parc Bodlondeb and Gwenallt-parc, Lixwm (SSSI)
Comin Helygain a Glaswelltiroedd Treffynnon / Halkyn Common and Holywell Grasslands (SSSI)
Tyddyn-y-barcut (SSSI)
Cefn Meadow (SSSI)
Alyn Valley Woods and Alyn Gorge Caves (SSSI)
Pen-y-Cefn Pasture (SSSI)
Llwyn (SSSI)
Llwyn (SAC)
Coed Nant Mawr (SSSI)
Alyn Valley Woods / Coedwigoedd Dyffryn Alun (SAC)
Chwarel Cambrian / Cambrian Quarry, Gwernymynydd (SSSI)
Bryn Alyn (SSSI)
Glaswelltiroedd Eryrys (Eryrys Grasslands) (SSSI)
Graig, Llanarmon-yn-Ial (SSSI)
Craig Adwy-wynt a Choed Eyarth House a Chîl-y-groeslwyd (SSSI)
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains (SAC)
Llandegla Moor (SSSI)
Thurstaston Common
Dee Cliffs
The Dungeon
Heswall Dales
Dee Estuary SAC, SPA, SSSI, and Ramsar site
Mynydd Y Fflint / Flint Mountain (SSSI)
Inner Marsh Farm (SSSI)
Inner Marsh Farm
Shotton Lagoons and Reedbeds (SSSI)
Connah's Quay Ponds and Woodland (SSSI)
Deeside and Buckley Newt sites (SAC)
Maes y Grug (SSSI)
Buckley Claypits and Commons (SSSI)
Coed Talon Marsh (SSSI)
Llay Bog (SSSI)
Midland Meres & Mosses Phase 2 (Wales)
Vicarage Moss (S
Liverpool Bay / Bae Lerpwl (England) (SPA)
New Ferry
Dibbinsdale
Mersey Estuary
Hallwood Farm Marl Pit
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) (SAC)
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (England) (SAC)
River Dee (England)
Chwarel Singret (SSSI)
Old Pulford Brook Meadows (SSSI)
Marford Quarry (SSSI)
Afon Dyfrdwy (River Dee) (SSSI)
Dee Cliffs,

N

1:125,000 @ A3

2,500 1,250 0 2,500 5,000 7,500 m

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LEGEND

- Indicative Site Boundary
- Study Area (15km Buffer of the Indicative Site Boundary)
- Ramsar Wetlands of international importance
- Special Protection Areas (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)

NOTES

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ISSUE PURPOSE

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PROJECT NUMBER

60717119

FIGURE TITLE

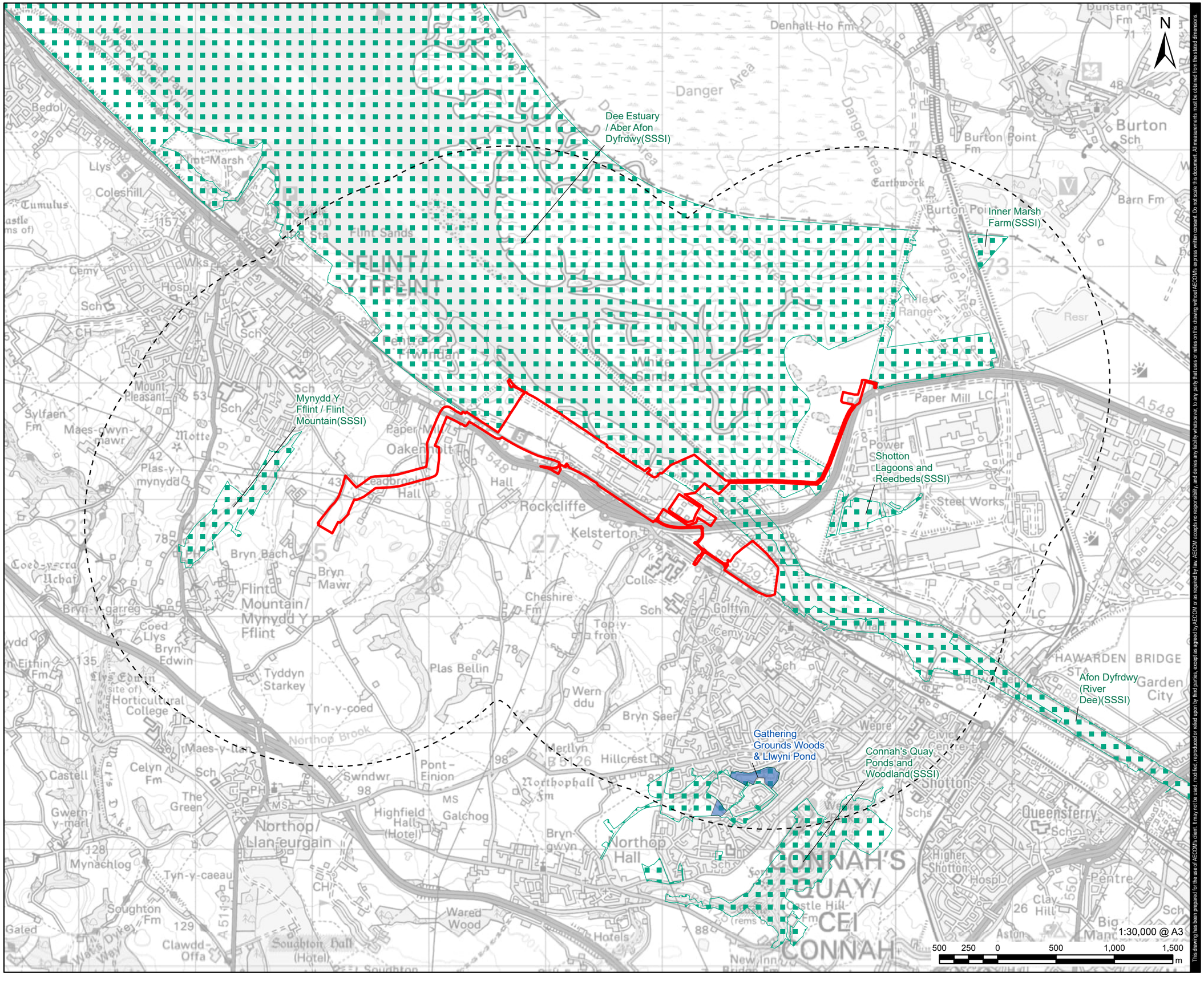
Statutory Designated Sites within 15km

FIGURE NUMBER

Figure 3

Revision: 0 Drawn: JG Checked: AB Approved: JC Date: 2024-01-30

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\PowerandCCS\000_CAD_GIS\020_GIS\02_Maps\Scoping Report\CO_SCO_Fig9-2_NationalLocalDesignatedSites2km_20240130_01.aprx



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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)

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ISSUE PURPOSE

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FIGURE TITLE

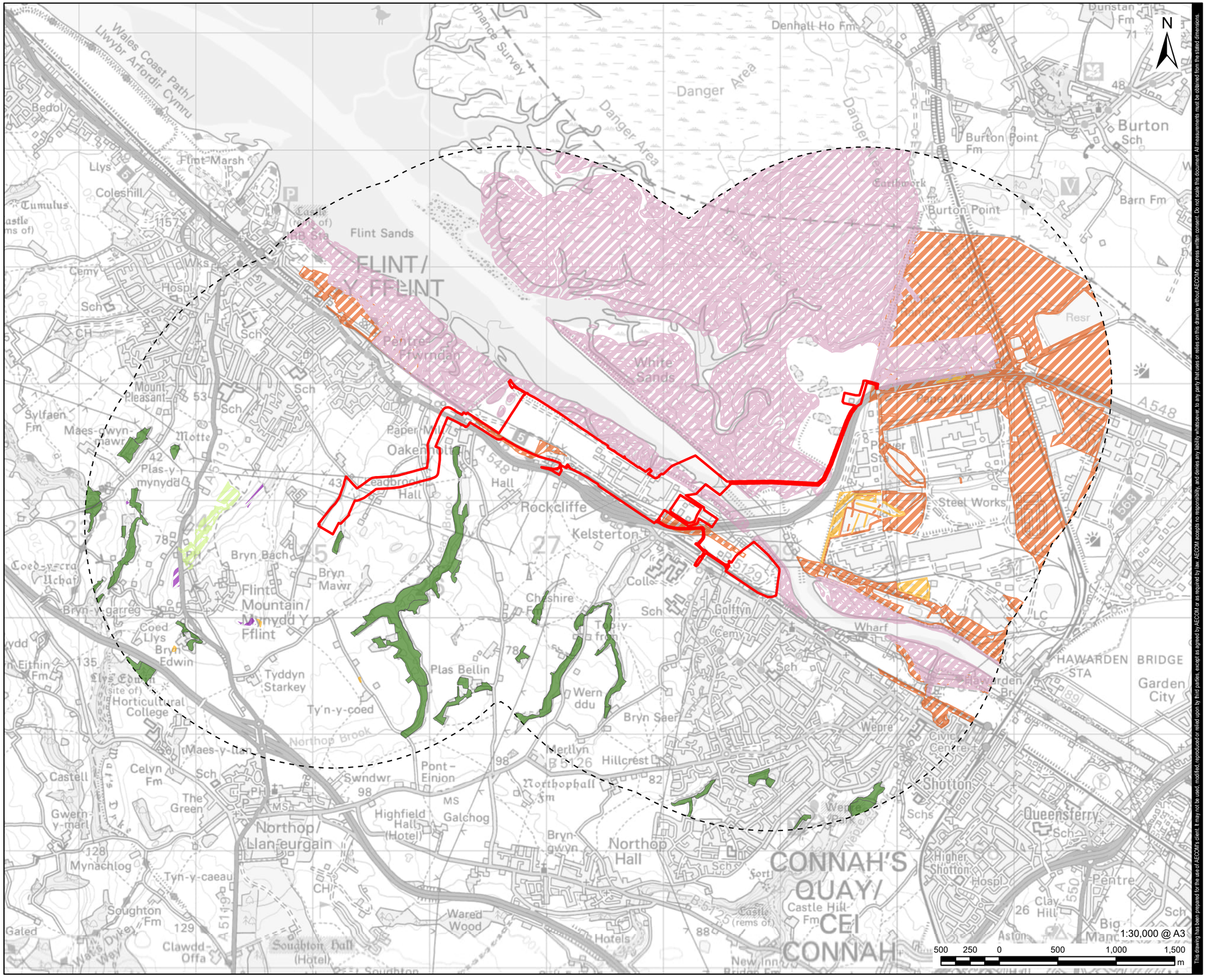
Statutory Designated Sites within 2km

FIGURE NUMBER

Figure 4

Revision: 0 Drawn: JG Checked: AB Approved: JC Date: 2024-01-30

Filename: L:\DCS\Projects\EGE\60717119_ConnahsQuay\PoweranCCS\900_CAD_GIS\920_GIS\02_Maps\Scoping Report\CQ_SCO_Fig9-3_AncientWoodlandsPriorityHabitats_20240130_01.aprx



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LEGEND

- Indicative Site Boundary
- Study Area (2km Buffer of the Indicative Site Boundary)
- Ancient Woodland

Priority Habitat

- Coastal and Floodplain Grazing Marsh
- Lowland fens and Reedbeds
- Lowland meadows
- Purple moor grass and rush pastures
- Saltmarsh

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FIGURE TITLE

Priority Habitats and Ancient Woodland within 2 km

FIGURE NUMBER

Figure 5

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Revision: 0 Drawn: JG Checked: GC Approved: JC Date: 2024-01-31

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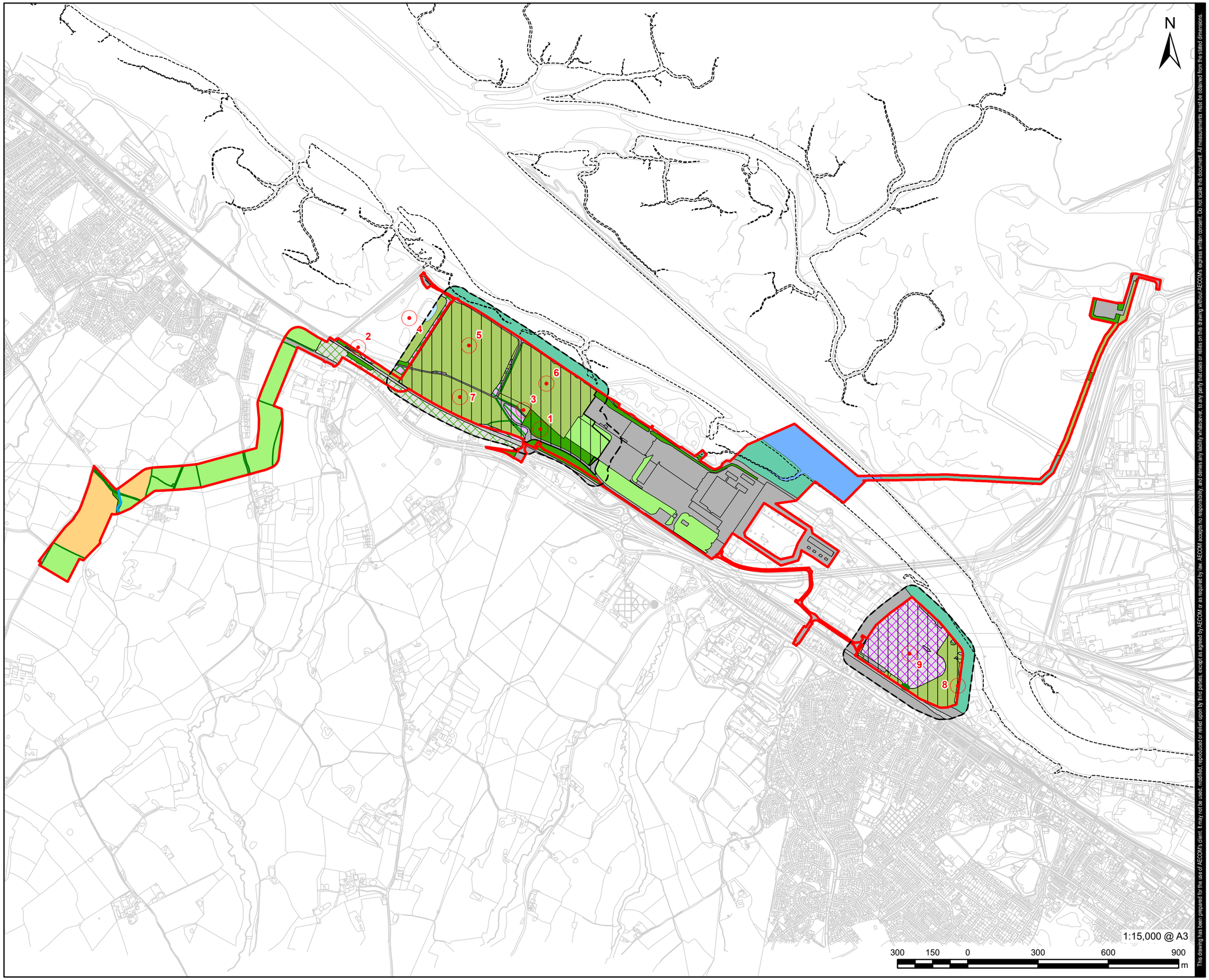

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LEGEND

- Indicative Site Boundary
- Area Accessed on Site
- 50m Buffer of the Area Accessed on Site
- High Water Mark
- Coastal saltmarsh - Saltmarshes and saline reedbeds
- Cropland - Cereal crops
- Grassland - Bracken
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Urban - Possible Open Mosaic Habitats on Previously Developed Land
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Rivers
- Other Standing Water Ponds
- Native hedgerow
- Other Rivers And Streams
- A3.1 - Broadleaved parkland/ scattered trees
- Target Note

NOTES

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Indicative UK Habitats

FIGURE NUMBER

Figure 6

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Annex B Relevant Legislation and Planning Policy

B.1 Legislation

The UK is no longer a member of the European Union (EU). EU legislation as it applied to the UK on 31 December 2020 is now a part of UK domestic legislation. EU legislation which applied directly or indirectly to the UK before 11.00 p.m. on 31 December 2020 has been retained in UK law as a form of domestic legislation known as 'retained EU legislation'.

The Secretary of State for the Environment, Food and Rural Affairs and Welsh Ministers have made changes to parts of the Conservation of Habitats and Species Regulations 2017 (referred to as the 2017 Habitats Regulations) so that they operate effectively. Most of these changes involve transferring functions from the European Commission to the appropriate authorities in Wales. All other processes or terms in the 2017 Habitats Regulations remain unchanged and existing guidance is still relevant.

B.2 Designated Sites

Special Protection Areas (SPA) / Special Areas of Conservation (SAC)

These sites in the UK no longer form part of the EU's Natura 2000 ecological network. The *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019* (referred to as the 2019 Regulations) have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes:

- existing SACs and SPAs
- new SACs and SPAs designated under these Regulations

Any references to Natura 2000 in the 2017 Habitats Regulations and in guidance now refers to the new national site network.

Formal Appropriate Assessment is required to be undertaken by the competent authority before undertaking, or giving consent, permission or other authorisation for any work which are likely to have a significant effect on such a site.

Wetland of International Importance (Ramsar site)

Designated under the *Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971* (the Ramsar Convention), in the UK, these sites are treated as having the same level of protection as SPA's and SAC's.

Sites of Special Scientific Interest

Under the *Wildlife and Countryside Act 1981* (as amended), it is an offence to carry out or permit to be carried out any operations likely to damage the Site of Special Scientific Interest (SSSI). These operations are listed in the SSSI notification.

Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under S.28 of the *Wildlife and Countryside Act 1981* (as amended), before undertaking operations likely to damage a SSSI. National Nature Reserve

National Nature Reserves (NNR) are established under the National Parks and Access to the Countryside Act 1949. Most NNRs are also underpinned by SSSIs and are therefore protected by the measures detailed above. For NNRs not underpinned by SSSIs it is still an offence to carry out or permit to be carried out any potentially damaging operation.

NNRs are given protection through policies in a local development plan.

Local Nature Reserve

A Local Nature Reserve (LNR) is a statutory designation made under National Parks and Access to the Countryside Act 1949, by principal local authorities (district, borough or unitary councils).

The local authority must control the LNR land - either through ownership, a lease, or an agreement with the owner.

LNRs are given protection through policies in a local development plan.

Locally Designated Sites

Local Wildlife Sites (LWS) are sites with ‘substantive nature conservation value’. They are defined areas, identified and selected for their nature conservation value, based on important, distinctive and threatened habitats and species with a region.

They are usually selected by the relevant Wildlife Trust, along with representatives of the local authority and other local wildlife conservation groups.

The LWS selection panel, select all sites that meet the assigned criteria, unlike SSSIs, which for some habitats are a representative sample of sites that meet the national standard. Consequently, many sites of SSSI quality are not designated and instead are selected as LWSs. Consequently, LWSs can be amongst the best sites for biodiversity.

Protected Species

Bats / Hazel Dormouse / Otter / Great Crested Newt / Smooth Snake / Sand Lizard / Natterjack Toad

These species, known as European Protected Species, are protected under Regulation 43 of the 2017 Habitats Regulations as amended by the 2019 Regulations. This makes it an offence to deliberately capture, injure or kill an animal; deliberately disturb an animal; or damage or destroy a breeding site or resting place used by an animal.

Deliberate capture or killing is taken to include “accepting the possibility” of such capture or killing. Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

Where development works are at risk of causing one or more of the offences listed above, a mitigation licence from Natural Resources Wales can be obtained to facilitate the works that would otherwise be illegal.

These species are also protected under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended). This makes it an offence to intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb an animal in such a place.

Lower levels of disturbance not covered by the 2017 Habitats Regulations remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Water Vole

Water voles are protected under *the Wildlife and Countryside Act 1981* (as amended). There are no licensing purposes that explicitly cover development or other construction activities which could have an impact on water voles.

When development work is proposed in or near an area which is either known to or likely to contain water voles, then the developer will need to implement suitable mitigation to prevent impacts to water voles. The preferred mitigation option is to leave water voles *in situ*, with the development works adopting avoidance measures through redesign of the proposals.

Where impacts cannot be avoided, operations aimed at displacing water voles from a development site are now no longer covered by the "*incidental result of an otherwise lawful action*" defence in the *Wildlife and Countryside Act 1981* (as amended). Displacement of water voles now needs to be undertaken under a licence.

In Wales, small scale (limited to continuous lengths of bank not exceeding 50 m) displacement of water voles can be carried out at certain times of the year (February to April) for the purposes of conservation under a Class Licence by a registered person. For larger scale displacements or displacements outside of this period, displacement can be undertaken under a site-specific conservation licence.

Where it is considered that the best outcome for water voles is capture and translocation to a different location, then this action is considered by Natural Resources Wales to be outside the scope of the defence as the intentional capture of water voles is unlikely to be considered 'incidental'. In these circumstances there may be genuine grounds for issuing a conservation licence for the purpose of translocating the water vole population to suitable alternative habitat.

Nesting Birds

All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended), with some species afforded greater protection under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended). In addition to the protection from killing or taking that all birds receive, Schedule 1 birds and their young must not be disturbed at the nest.

There are no licensing purposes that explicitly cover development activities affecting wild birds.

Common Species of Reptile (common lizard, slow worm, grass snake and adder)

Common species of reptile are protected against intentional killing and injury under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended). There is no requirement for a licence where development works affect common species of reptiles. Instead, where reptiles are present, they should be protected from any harm that might arise during the development works through appropriate mitigation.

Badger

Badgers and their setts are protected under the *Protection of Badgers Act 1992* (as amended). This makes it an offence to wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett.

It is not illegal to carry out disturbance activities near setts that are not occupied, i.e. those that do not show signs of current use.

Where required, licences for development activities involving disturbance or sett interference or closure are issued by Natural Resources Wales. Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process.

Natural Resources Wales provide guidance on working close to badger setts and the methods that can be employed to avoid or minimise impacts to active badger setts[37].

Licences are normally not granted from December to June inclusive (the badger breeding season) because dependent cubs may be present within setts.

Species and Habitats of Principal Importance for the Conservation of Biodiversity

Section 7 of the Environment (Wales) Act 2016 replaces the duty in section 42 of the NERC Act 2006. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales.

The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section and encourage others to take such steps.

Part 1 of the Act, including Sections 6 and 7, came into force on May 21, 2016.

Hedgerows

Under the Hedgerows Regulations 1997, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. In general, permission will be required before removing hedges that are at least 20 metres in length, over 30 years old and contain certain species of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.

[37] *Badgers – A Guide for Developers*. Natural Resources Wales. January 2018.

Non-native Invasive Species

Under the Wildlife and Countryside Act 1981 (as amended), it is an offence to plant or otherwise cause these species to grow or spread in the wild.

Any contaminated soil or plant material is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with section 34 of the Environmental Protection Act 1990.

B.3 Planning Policy

Planning Policy Wales

Planning Policy Wales (PPW) (2021) explains that planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions so that development does not cause any significant loss of habitats or populations of species, locally or nationally and 'must provide a net benefit for biodiversity'. PPW also notes that ancient woodland and individual ancient and veteran trees are irreplaceable habitat and should be afforded protection from development unless there are significant and clearly defined public benefits.

Local Planning Policy

The Local Policy for Cyngor Sir y Fflint Flintshire County Council is currently set out within the 'Flintshire Local Development Plan 2015 - 2030 (Adopted January 2023)'.[38] The following policies are relevant to the EcIA:

- Policy STR13: Natural and Built Environment, Green Networks and Infrastructure;
- Policy EN2: Green Infrastructure;
- Policy EN3: Undeveloped Coast and Dee Estuary Corridor;
- Policy EN6: Site of Biodiversity Importance; and
- Policy EN7: Development Affecting Trees, Woodland and Hedgerows.

Local Biodiversity Action Plans

The Flintshire Biodiversity Strategy is set out on the Flintshire Biodiversity Action Plan (FBAP).[39]

[38] Flintshire Local Development Plan Available here: https://cyfarfodyddpwyllgor.siryfflint.gov.uk/documents/s74248/Adoption%20of%20the%20Flintshire%20Local%20Development%20Plan%20LDP.pdf?LLL=1

[39] Flintshire Biodiversity Action Plan Available here: https://www.flintshire.gov.uk/en/PDFFiles/Countryside--Coast/Biodiversity/Flintshire-County-Council-Environment-Act-Section-6-Biodiversity-Duty-Delivery-Plan-update-2020.pdf

Annex C Methodology

C.1 Desk Study

Background Records Search

The preliminary ecological assessment includes a desk study to obtain background records relevant to the Site and the Proposed Development. The data obtained provides contextual information for the scope of field surveys, to aid the evaluation of field survey results, and to provide supplementary information where complete field survey coverage is not possible.

The study area is dependent upon the nature, timing and scale of the Proposed Development, as well as the location of the Site and the surrounding landscape. These variables all contribute to what is referred to as the Zone of Influence (ZoI) of the Proposed Development, which is the area over which ecological features may be affected by biophysical changes because of the works and associated activities.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was reviewed for the following information:

- Designated sites of nature conservation importance (statutory sites only) within 2 km of the Site. This was extended to 15 km for internationally designated sites: Special Protection Areas (SPAs), Wetlands of International Importance (Ramsar sites) Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs); and,
- Notable habitats within 2 km of the Site, these being areas of ancient woodland and 'Habitats of Principal Importance for the Conservation of Biodiversity' included in Section 7 of the Environment (Wales) Act 2016.

Aerial habitat survey

The habitats within areas of the Site boundary not covered by the field surveys were identified using publicly available aerial mapping sources such as google earth[40] since land access had not been agreed at the time of survey.

C.2 Field Survey

A site-walkover to survey habitats within the Main Site and Indicative Enhancement Area boundary plus up to 50m to re-affirm habitats on the ground with reference to existing baseline surveys (see Section 3), the UK Habitat Classification[41] and the CIEEM guidelines for Preliminary Ecological Appraisal (PEA)[42].

The Habitat Survey was also used to re-affirm the potential of habitats to support protected and/or notable fauna, including protected species, Species of Principal Importance and local Biodiversity Action Plan (BAP) species. Any field signs and direct sightings of protected or notable species and any invasive species noted during the survey were also be recorded using the following methodologies:

[40] Google Earth Available at: https://earth.google.com/web
[41] UKHab Ltd (2023), UK Habitat Classification Version 2.0 (at: https://www.ukhab.org)
[42] CIEEM (2017), Guidelines for Preliminary Ecological Appraisal. Second Edition. Chartered Institute of Ecology and Environmental Management, Winchester (at https://cieem.net/wp-content/uploads/2019/Guidelines-for-Preliminary-Ecological-Appriasal-Jan2018-1.pdf).

- **Badger**: the survey involves assessing the potential of habitats within the Survey Area to support badger, following the methodology detailed in Scottish Badgers (2018)[43], Harris et al (1989)[44] and Badger Trust (2023)[45];
- **Bats**: the survey involves assessing the potential of habitats within the Survey Area to support bats, in accordance with Bat Conservation Trust (BCT) guidance (2023)[46];
- **Hazel dormouse**: the survey involves assessing the potential of habitats within the survey area to support hazel dormouse, following English Nature guidance (2006)[47];
- **Otter**: the survey involves assessing the potential of watercourses and water bodies, and adjacent terrestrial habitat within the survey area to support otter, following RSPB (1994) and Chanin, P. (2003)[48] guidance;
- **Water vole**: the survey involves assessing the potential of watercourses and water bodies within the survey area to support water vole, following The Mammal Society (2016)[49] guidance;
- **Birds**: the survey involves assessing the potential of habitats within the survey area to support breeding, wintering or migrating birds, either individually notable species or assemblages of both common and rarer species;
- **Great crested newt**: the survey involves assessing the potential of habitats within the survey area to support great crested newt, following English Nature (2001)[50] and Froglife (2001)[51] guidance;
- **Reptiles**: the survey involves assessing the potential of habitats within the survey area to support reptiles (typically adder, grass snake, common lizard and slow worm only, though in some locations and habitat types (most notably heathland) may also include smooth snake and sand lizard), following Froglife (1999)[52] and JNCC (2003)[53] guidance;
- **Notable species of invertebrate**: the survey involves assessing the potential of habitats within the survey area to support notable species of invertebrates, both terrestrial and aquatic (including white-clawed crayfish);
- **Protected or Notable species of plants**: the survey involves recording protected or notable plant species;

[43] Scottish Badgers (2018). *Surveying for Badgers: Good Practice Guidelines*. Version 1.
[44] Harris, S. Cresswell, P. and Jefferies, D. (1989). *Surveying Badgers*.
[45] Badger Trust (2023) Badger Protection: Best Practice Guidance for Developers, Ecologists and Planners (Wales)
[46] Collins, J.(ed) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edition). The Bat Conversation Trust. London.
[47] English Nature (2006). *The Dormouse Conservation Handbook*, 2nd edition
[48] Chanin, P (2003b). *Monitoring the Otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. English Nature, Peterborough.
[49] Dean, M. Strachan, R. Gow, D. Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Guidance Series).* Eds Fiona Mathews and Paul Chanin. The Mammal Society. London.
[50] English Nature (2001). *The Great Crested Newt Mitigation Guidelines*.
[51] Froglife (2001). *The Great Crested Newt Conservation Handbook*.
[52] Froglife (1999). *Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.
[53] Joint Nature Conservation Committee (2003). Herpetofauna Workers Manual.

- **Other notable species**: the survey involves assessing the potential of habitat within the survey area to support other Notable Species, such as hedgehog, brown hare, polecat or common toad;
- **Non-native invasive plant species**: the survey involves recording evidence of the presence of invasive plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and subject to strict legal control.

C.3 Limitations and Assumptions

i) This PEA (January 2024) is a point in time appraisal of the indicative land required for the Proposed Development utilising data gathered up to November 2023 detailed herein.

ii) The data informing the advice given in this PEA report cannot be relied on indefinitely, however “it is difficult to set a specific timeframe over which reports or survey data should be considered valid, as this will vary in different circumstances” (CIEEM, 2019b).

iii) It was not possible to directly access the areas of salt marsh (on health and safety grounds and to avoid disturbance to foraging and roosting birds) to the north of the Survey Area.

iv) At the time of reporting, it was not possible to request information from the local biological records office. Therefore, historic information on local designated sites and protected and notable species may have been missed. This information will be requested and the PEA updated accordingly.

v) Some field signs associated with fauna may not have been identified, but that sufficient information was gathered to evaluate habitats and features and provide recommendations for further survey and outline recommendations for mitigation.

vi) The field survey was conducted in November so many plant species may have died off and not been present at the time of the survey.

Annex D Target Notes and Photos

Target Note (Refer to Figure 6 in Annex A)	Description	Photo
TN1	Woodland corridor suitable for commuting bats (tree roost potential assessment needed) and nesting, foraging and sheltering birds, foraging badgers also possible	
TN2	Woodland corridor suitable for commuting bats (tree roost potential assessment needed) and nesting, foraging and sheltering birds, foraging badgers also possible	

Target Note (Refer to Figure 6 in Annex A)	Description	Photo
TN3	Ruderal with mammal tracks, likely fox, but potential for foraging badger and potential for reptiles	
TN4	Grassland and wetland habitats suitable for waders	

Target Note (Refer to Figure 6 in Annex A)	Description	Photo
TN5	Grassland and suitable for waders. Approx 60 curlew present during survey	
TN6	Grassland and suitable for waders. Approx 30 curlew present during survey	

Target Note (Refer to Figure 6 in Annex A)	Description	Photo
TN7	Grassland potentially suitable for waders, perhaps less so than other fields. Sheep present. No waders present during survey	
TN8	Bracken potentially suitable for reptiles	No picture
TN9	Ephemeral/colonising habitat potentially botanically interesting and potential for invertebrates/pollinators - needs both survey assessments.	

Annex E Aspect Ecology Reports

Connah's Quay Power Station:
Northern Land Parcel

Phase 1 Habitat and Faunal Surveys

July 2023

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Executive Summary

i) **Introduction.** Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake baseline ecological surveys of the Northern Land Parcel at Connah's Quay Power Station, Connah's Quay, Flintshire.

ii) **Survey.** The site was surveyed in August 2021 and April 2023 based on standard extended Phase 1 methodology. In addition, a general appraisal of faunal species was undertaken to record the potential presence of any protected, rare or notable species, with specific surveys conducted in respect of bats, Badger and Otter.

iii) **Ecological Designations.** The site lies adjacent to the statutory designation Dee Estuary (SPA, Ramsar and SAC). This is a vast site which extends substantially from the site's northern and western boundaries. The nearest non-statutory designation is Leadbrook Wood (LWS) located approximately 260m south of the site, separated from it by industrial development, roads and the railway.

iv) **Habitats.** The site comprises areas of rough pasture and improved grassland, scrub, tall ruderal vegetation, hardstanding, hedgerows and tree lines.

v) **Protected Species.** The site generally offers few opportunities for protected species although evidence of badger foraging activity was recorded during the survey work. Several trees were identified with low potential to support roosting bats and it is likely that bats forage and commute along linear habitats within and around the site. Although no evidence of their presence was confirmed by surveys, Otter are highly likely to make use of habitat adjacent to and outside the site boundary associated with the Dee Estuary.

1 Introduction

1.1 Background and Proposals

1.1.1 Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake a desk study and baseline ecological surveys of the Northern Land Parcel at Connah's Quay Power Station, Connah's Quay, approximately centred at grid reference SJ 270 716 (see Plan 6322/ECO1), hereafter referred to as 'the site'.

1.2 Site Overview

1.2.1 The site is located in north-east Flintshire in North Wales (see Plan 6322/ECO1). The site is bounded to the north-east by the River Dee, beyond which extend large areas of open wetland associated with the River Dee Estuary. Connah's Quay Power Station is located immediately adjacent to the site's south-eastern boundary and a railway line and industrial development, with associated planting, forms the site's southern boundary. A field outside the site, adjacent to the northern site boundary, contains three ponds.

1.2.2 The site itself comprises grassland fields with roads, treelines, hedgerows, along with areas of scrub and tall ruderal vegetation.

1.3 Purpose of the Report

1.3.1 This report documents the methods and findings of the desk study and baseline ecology surveys undertaken. The importance of the habitats and species present is evaluated.

2 Methodology

2.1 Data Search

2.1.1 Background information relevant to the site and its immediate surroundings to a distance of 2km was sourced from the North Wales Environmental Information Service (Cofnod) in August 2021. The data obtained comprised information on designated sites and species records.

2.1.2 Information on statutory designations was obtained from the MAGIC database[1], which uses data provided by Natural England, from within an extended search area of 25km. The MAGIC database was also searched for the presence of Priority Habitats within or adjacent to the site. Relevant information is reproduced in Appendix 6322/1 and on Plan 6322/ECO2.

2.1.3 In addition, the Woodland Trust database[2] was searched for records of ancient, veteran or notable trees within or in proximity to the site.

2.2 Habitat Survey

2.2.1 The site was surveyed in August 2021 and April 2023 to assess the general ecological value of the land and to identify the main habitats and ecological features present. Habitats present are shown on Plan 6322/ECO3.

2.2.2 The site was surveyed based on standard Phase 1 Habitat Survey methodology[3], whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail through Phase 2 surveys. This method was extended, in line with the Guidelines for Preliminary Ecological Appraisal[4] to record details on the actual or potential presence of any notable or protected species or habitats.

2.2.3 The nomenclature used for plant species within this report is based on that of the Botanical Society for the British Isles (BSBI) Checklist and Stace (2019) [5].

2.3 Faunal Surveys

2.3.1 General faunal activity, such as mammals or birds observed visually or by call during the course of the surveys was recorded during all surveys. Attention was paid to the potential presence of protected, rare or notable species as described below.

[1] Multi-Agency Geographic Information for the Countryside (MAGIC), https://magic.defra.gov.uk/

[2] Woodland Trust Ancient Tree Inventory, https://ati.woodlandtrust.org.uk/, consulted March 2022.

[3] Joint Nature Conservation Committee (2010, as amended) 'Handbook for Phase 1 habitat survey: A technique for environmental audit.'

[4] Chartered Institute for Ecology and Environmental Management (CIEEM) (2013) 'Guidelines for Preliminary Ecological Appraisal.'

[5] Stace, C (2019) *'New Flora of the British Isles (4th Edition)'* C & M Floristics

Bats[6]

Visual Inspection Surveys

2.3.2 **Trees**. Trees were assessed for their suitability to support roosting bats based on the presence of potential roosting features such as holes, cracks, splits or loose bark. Suitability for roosting bats was rated based on relevant guidance[7] as:

- Negligible;
- Low;
- Moderate; or
- High.

2.3.3 Where possible. potential roost features identified were inspected for signs indicating possible use by bats, including staining, scratch marks or bat droppings.

Badger (*Meles meles*)

2.3.4 A Badger survey was carried out in August 2021 and again in April 2023. The survey, undertaken in accordance with standard methods[8], comprised two main elements. The first element involved searching for evidence of Badger setts. For any setts that were encountered, each sett entrance was noted and mapped. The survey set out to record the following information, where present:

- Number and location of well used / active entrances; these are clear from any debris or vegetation and are obviously in regular use and may, or may not, have been excavated recently;
- Number and location of inactive entrances; these are not in regular use and have debris such as leaves and twigs in the entrance or have plants growing in or around the edge of the entrance; and
- Number of disused entrances; these have not been in use for some time, are partly or completely blocked and cannot be used without considerable clearance. If the entrance has been disused for some time all that may be visible is a depression in the ground where the hole used to be and the remains of the spoil heap.

2.3.5 The second element involved searching for signs of Badger activity such as well-worn paths and push-throughs, snagged hair, footprints, latrines and foraging signs, so as to build up a picture of any use of the site by Badger.

Otter (*Lutra lutra)*

2.3.6 The boundary of the site beside the Dee Estuary and all parts of the site itself were searched for signs of Otter[9] in August 2021 and again in April 2023. Such signs include holts (underground chambers used for lying up), spraints, prints, paths and slides. The southern bank of the estuary was examined where possible, using binoculars where appropriate.

[6] English Nature (2004) *'Bat Mitigation Guidelines'*

[7] Collins, J. (ed.) (2016) '*Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn).' Bat Conservation Trust

[8] Mammal Society (1989) '*Occasional Publication No. 9 – Surveying Badgers*'

[9] Life in UK Rivers (2003) *'Monitoring the Otter - Conserving Natura 2000 Rivers*'. Monitoring Series No. 10

Water Vole (*Arvicola amphibius)*

2.3.7 The boundary of the site beside the Dee Estuary and all parts of the site itself were searched for signs of Water Vole[10] in August 2021 and again in April 2023. Such signs include latrines, tunnels, lawns (small areas of vegetation grazed by Water Vole) and footprints. The southern bank of the estuary was examined where possible, using binoculars where appropriate.

2.4 Survey Constraints and Limitations

2.4.1 All of the species that occur in each habitat are not necessarily detectable during survey work carried out at any given time of the year, since different species are apparent during different seasons. The Phase 1 habitat surveys were undertaken within the optimal season and during different months, thereby allowing a robust and thorough assessment of habitats and botanical interest across the site.

2.4.2 All parts of the site and its immediate surroundings were accessed at the time of both surveys.

2.4.3 The presence of invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was noted. However, the detectability of such species varies according to time of year, management regime and other factors and this report should not be taken as definitive regarding the presence or absence of such species at the site.

2.4.4 Densely vegetated habitats and areas that have limited access such as steep river banks may reduce the detectability of field signs of species such as Badger, Otter and Water Vole. Whilst some areas of dense vegetation are present within the site, these were searched as thoroughly as practicable and hence it is considered that the survey results provide a sufficiently accurate baseline to assess the potential impacts of the proposals on all species assessed.

2.5 Ecological Evaluation Methodology

2.5.1 The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018)[11], which involves identifying 'important ecological features' within a defined geographical context (i.e. international, national, regional, county, district, local or site importance). Further detail is provided in Appendix 6322/2.

2.6 National Policy Approach to Biodiversity in the Planning System

2.6.1 National Planning Policy in Wales is set out in Planning Policy Wales (PPW)[12]. This describes policies designed to maximise environmental protection and limit environmental impact including the promotion of resilient biodiversity and ecosystems, citing biodiversity as an

[10] Surveys based on: Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) '*Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.*

[11] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'*, ver. 1.1, Chartered Institute of Ecology and Environmental Management, Winchester

[12] Llywodraeth Cymru/Welsh Government (2021). *'Planning Policy Wales'*, Edition 11, February 2021.

element in the delivery of distinctive and natural places, and ensuring environmental sustainability through good design.

2.6.2 PPW sets out a framework for the sustainable management of natural resources, which within which the planning system contribute by:

'• improving the resilience of ecosystems and ecological networks;

• halting and reversing the loss of biodiversity;

• maintaining and enhancing green infrastructure based on seeking multiple ecosystem benefits and solutions;' amongst other measures.

2.6.3 PPW embeds the protection and enhancement of biodiversity within all components of the planning system in Wales, stating that:

'Biodiversity loss should be reversed, pollution reduced, environmental risks addressed and overall resilience of ecosystems improved.'

2.6.4 The approach to dealing with biodiversity in the context of planning applications is set out on Section 6.4, stating:

'The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.'

and

'Development plan strategies, policies and development proposals must consider the need to:

• support the conservation of biodiversity, in particular the conservation of wildlife and habitats;

• ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;

• ensure statutorily and non-statutorily designated sites are properly protected and managed;

• safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and

• secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.'

'All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission.'

2.6.5 PPW does not currently mandate a target for Biodiversity Net Gain, but does set out that:

'…development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity;'

'…planning decisions should incorporate measures which seek the creation, restoration and appropriate management of green networks and linkages between habitats and maintaining and enhancing other green infrastructure features and networks'.

2.6.6 The above approach encapsulates the 'mitigation hierarchy' described in British Standard BS 42020:2019[13], which involves the following step-wise process:

- **Avoidance –** avoiding adverse effects through good design;
- **Mitigation –** where it is unavoidable, mitigation measures should be employed to minimise adverse effects;
- **Compensation –** where residual effects remain after mitigation it may be necessary to provide compensation to offset any harm; and
- **Enhancement –** planning decisions often present the opportunity to deliver benefits for biodiversity, which can also be explored alongside the above measures to resolve potential adverse effects.

2.6.7 The measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development (BS 42020:2019, section 5.5).

2.7 Local Policy

2.7.1 The Local Policy for Cyngor Sir y Fflint Flintshire County Council is currently set out within the 'Flintshire Local Development Plan 2015 - 2030 (Adopted January 2023)'. Policies that relate specifically to ecology and biodiversity are set out below.

2.7.2 Policy EN2: Green Infrastructure

"Development proposals will be required to protect, maintain and enhance the extent, quality and connectivity of the green infrastructure network, including designated and non-designated green spaces (as shown on the proposals maps and listed in the table below), and where appropriate:

a. Create new green infrastructure linkages from the proposed development to the existing local network;

b. Fill in gaps in the existing network to improve connectivity.

Where the loss or damage of existing green infrastructure is unavoidable, appropriate mitigation and compensation will be required."

2.7.3 Policy EN3: Undeveloped Coast and Dee Estuary Corridor states:

"Within the undeveloped coast development will only be permitted where:

[13] British Standards Institution (2013) '*Biodiversity – Code of practice for planning and development*', BS 42020:2019

a. *It can be demonstrated a coastal location is essential;*

b. *It conserves and enhances the open character of the coast;*

c. *It would not unacceptably harm areas of nature conservation, landscape or biodiversity;*

d. *It would not harm existing or proposed recreational or active travel routes;*

e. *Extensive coastal protection measures are not required; and*

f. *It would not be potentially at risk of flooding nor unacceptably increase erosion or flooding or interfere with natural coastal processes."*

2.7.4 Policy EN6: Sites of Biodiversity and Geodiversity Importance states:

"Development will not be permitted that would result in an adverse effect on the integrity of sites of international nature conservation importance. Proposals where adverse effects on site integrity cannot be ruled out would not be supported.

Development likely to impact the special features of a Nationally Designated Site will only be granted in exceptional circumstances where appropriate compensation can be provided. Development proposals that would have a significant adverse effect on locally designated sites or site with other biodiversity and / or geological interest, including priority species, will only be permitted where:

a. *it can be demonstrated that the need for the development outweighs the biodiversity or geological importance of the site; and*

b. *it can be demonstrated that the development cannot reasonably be located elsewhere; and*

c. *any unavoidable harm is minimised by effective mitigation to ensure that there is no reduction in the overall biodiversity value of the area. Where this is not feasible compensation measures designed to create, restore and enhance biodiversity must be provided.*

Development that results in the restoration, enhancement and creation of habitats will be supported especially where this promotes the resilience of ecosystems."

2.7.5 Policy EN7: Development Affecting Trees, Woodlands and Hedgerows states:

"Development proposals that will result in significant loss of, or harm to, trees, woodlands or hedgerows of biodiversity, historic, and amenity value will not be permitted.

Where the impact of development affecting trees, woodlands or hedgerows is considered acceptable, development will only be permitted where:

a. *the development maximises their retention through sensitive design*

b. *measures; and*

c. *where the removal of trees is considered necessary, suitable replacements*

d. *shall be provided elsewhere within the site; and*

e. *it results in a net benefit in biodiversity."*

2.7.6 Policy EN7: Development In or Adjacent to Conservation Areas states:

"Development within or adjacent to a conservation area will only be permitted if it would preserve or enhance the character and appearance of the conservation area or its setting. New development in such locations must also be of a high standard of design, respond to the area's special characteristics, and pay particular regard to:

a. important views, vistas, street scenes, roofscapes, trees, open spaces, gaps and other features that contribute to the character or appearance of the conservation area;

b. the retention of historically significant boundaries or other elements that contribute to the established form of development;

c. the relationship to existing buildings and spaces, and pattern of development;

d. scale, height and massing, architectural design and detailing, the use of materials, boundary treatment, and public realm materials."

3 Ecological Designations

3.1 Statutory Designations

Description

3.1.1 The statutory designations of ecological importance that occur within the local area are shown on Plan 6322/ECO2.

3.1.2 The Dee Estuary Special Protection Area (SPA), Ramsar site, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), all of which designations cover the same area, extends beyond the site's northern and western boundaries. The Dee Estuary is designated as a SPA and Ramsar site on the basis of its breeding and winter waterbird populations and assemblages. It is designated as a SAC on the basis of its mudflats and sandflats, annual colonising mud and sand and Atlantic salt meadow habitats (see Appendix 6322/1 for citation sheets).

3.1.3 The next closest statutory designation to the site is Mynydd y Fflint/Flint Mountain SSSI, approximately 1.4km to the west. This site comprises unimproved grassland and woodland in association with other habitats that support a diverse flora

3.1.4 The River Dee and Bala Lake Special Area of Conservation (SAC) is located approximately 2.6km east of the site at its closest point. This is an extensive site covering over 1200ha extending through North Wales along the River Dee to Bala Lake. The SAC is designated for Atlantic Salmon *Salmo salar*, Floating Water-plantain *Luronium natans*, and for comprising a watercourse of plain to montane level with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation characterised by an abundance of Water-crowfoot *Ranunculus* spp.

3.1.5 Other statutory designations in the wider area include Deeside and Buckley Newt Sites SAC approximately 2.5km south of the site and Halkyn Mountain SAC over 5km to the west.

Evaluation

3.1.6 The site lies adjacent to the Dee Estuary SPA/Ramsar/SAC (see Plan 6322/ECO2).

3.1.7 No other statutory designation would be at risk of adverse effects as a result of works at the site.

3.2 Non-statutory Designations

Description

3.2.1 The non-statutory designations of nature conservation interest that occur within the local area are shown on Plan 6322/ECO2. The nearest non-statutory designation is Leadbrook Wood Local Wildlife Site (LWS) approximately 260m south of the site, separated from it by industrial development, roads and the railway. This LWS is designated because it is an area of semi-natural broad-leaved woodland occupying a deeply wooded valley in which the Lead Brook and its tributaries flow (see Appendix 6322/1 for citation).

3.2.2 The next nearest non-statutory designation is Top-y-fron Dingle and Kelserton Brook LWS approximately 800m south-east of the site. This is a similar wooded valley to Leadbrook Wood LWS located further to the south.

3.2.3 All non-statutory designations are separated from the site by intervening development and road and rail infrastructure and are not likely to be at risk of adverse effects resulting from works undertaken at the site.

Evaluation

3.2.4 The site itself is not subject to any non-statutory nature conservation designations. All non-statutory designations in the surrounding area are sufficiently distant from the site and separated by other land uses that they are unlikely to be affected by activities at the site.

3.3 Priority Habitats, Ancient Woodland and Notable Trees

Description

3.3.1 No Priority habitats are located within the site, however, the Priority Habitat Saltmarsh is present outside the site immediately adjacent to the northern and western site boundaries, within the River Dee Estuary.

3.3.2 There are no areas of ancient woodland within the site or its wider area.

3.3.3 There are no records of any notable or veteran trees within or adjacent to the site.

4 Habitats and Ecological Features

4.1 Background Records

4.1.1 Data supplied by Cofnod from the last 10 years within 2km of the site included records of the Flintshire Rare plant species (occurring in no more than three 2km tetrads within the vice-county) Rock Samphire *Crithmum maritimum*, Caper Spurge *Euphorbia lathyris*, Narrow-leaved Pepperwort *Lepidium ruderale*, Sweet Briar *Rosa rubiginosa*, Annual Pearlwort *Sagina apetala* subsp. *apetala*, Long-spiked Glasswort *Salicornia dolichostachya*, Wild Clary *Salvia verbenaca*, Knotted Hedge-parsley *Torilis nodosa* and Navelwort *Umbilicus rupestris.*

4.1.2 Records were also returned of the Flintshire Scarce species (occurring in 4-8 2km tetrads) Red Goosefoot *Chenopodium rubrum*, Perennial Wall-rocket *Diplotaxis tenuifolia*, Wood Spurge *Euphorbia amygdaloides*, Small-flowered Crane's-bill *Geranium pusillum*, Stinking Iris *Iris foetidissima*, Prickly Lettuce *Lactuca serriola*, Narrow-leaved Meadow-grass *Poa angustifolia* and Reflexed Saltmarsh-grass *Puccinellia distans.*

4.1.3 Records were also returned of numerous invasive species including Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera,* Cherry Laurel *Prunus laurocerasus* and *Cotoneaster* sp.

4.1.4 No evidence of the presence of any of these species within the site was recorded during any of the surveys undertaken.

4.2 Overview

4.2.1 The habitats and ecological features present within the site are described below and evaluated in terms of whether they constitute an important ecological feature and their level of importance, taking into account the status of habitat types and the presence of rare plant communities or individual plant species of elevated interest. The likely effects of potential works on these habitats and ecological features are then assessed. The value of habitats for the fauna they may support is considered separately in Chapter 5 below.

4.2.2 The following habitats and ecological features were identified within the site:

- Rough Pasture and Improved Grassland;
- Scrub;
- Tall Ruderal Vegetation;
- Hardstanding; and
- Hedgerows and Tree Lines.

4.2.3 These habitats and features are shown on Plan 6322/ECO3 and described below.

4.3 Priority Habitats

4.3.1 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. In particular, Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats which are of principal importance for conservation in England. This list is largely derived from the 'Priority Habitats' listed under the former UK

Biodiversity Action Plan (BAP), which continue to be regarded as priority habitats under the subsequent country-level biodiversity strategies.

4.3.2 Of the habitats within the site, hedgerows are likely to qualify as Priority Habitat.

4.4 Rough Pasture and Improved Grassland

Description

4.4.1 The site contains three grassland fields (**F2-F4**).

4.4.2 Field **F2** comprises rough grassland dominated by common and widespread species including Perennial Rye-grass *Lolium perenne*, Creeping Bent *Agrostis stolonifera*, Red Fescue *Festuca rubra,* Yorkshire-fog *Holcus lanatus* and Cock's-foot *Dactylis glomerata*. Herbs include Creeping Thistle *Cirsium arvense*, Ragwort *Senecio jacobaea*, Nettle *Urtica dioica,* Dock *Rumex* sp., Hogweed *Heracleum sphondylium*, Wild Carrot *Daucus carota*, Burdock *Arctium minus* and Red Clover *Trifolium pratense*. This field is occasionally sheep-grazed with a sward height of 20-30cm.

4.4.3 Field **F3**, immediately south of **F2**, comprises sheep-grazed pasture with a sward height of 2-5cm. Species present included Perennial Rye-grass *Lolium perenne*, False Oat-grass *Arrhenatherum elatius*, Crested Dog's-tail *Cynosurus cristatus,* Yarrow *Achillea millefolium* and Red Clover.

4.4.4 Field **F4** which is the easternmost mostly comprises improved grassland with a sward height of 2-5cm, with smaller areas of longer rough grassland to the south. The field is dominated by Perennial Rye-grass, with Red Clover and Creeping Thistle also present. Rough grassland tends to scrub along the southern field boundary, where a higher proportion of False Oat-grass is present amongst the scrub (see 4.5).

Evaluation

4.4.5 Overall, the grassland fields support a low diversity of common and widespread species. These habitats are considered to be of low ecological value and do not form important ecological features.

4.5 Scrub

Description and Evaluation

4.5.1 Areas of dense and scattered scrub are present within the site as shown on Plan 6322/ECO3.

4.5.2 Dense scrub is present beyond the northern boundary of field **F2** and also immediately south of field **F4** and beside the entrance road to the site. Scattered scrub is intermittently present throughout the site. Patches of dense scrub are also present beside hedgerow **H3** between fields **F2** and **F4**.

4.5.3 Scrub comprises common and widespread species of limited botanical interest including Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*, Bramble *Rubus fruticosus* agg., Dogwood *Cornus sanguinea*, Hazel *Corylus avellana,* Silver Birch *Betula pendula*, Elder *Sambucus nigra*, Gorse *Ulex europaeus* and Ash *Fraxinus excelsior*.

4.5.4 The areas of scrub within the site are composed of common and widespread species of low botanical interest. These habitats are not important ecological features and their loss would be of minor significance.

4.6 Tall Ruderal Vegetation

Description and Evaluation

4.6.1 Several small areas of tall ruderal vegetation were recorded, typically in association with field boundaries and hedges (see Plan 6322/ECO3).

4.6.2 Tall ruderal vegetation was dominated by Common Nettle, Dock, Hogweed, Creeping Thistle, Mugwort *Artemisia vulgaris*, and Redshank *Persicaria maculosa*. These are common and widespread species of limited botanical interest which readily colonise field margins and disturbed ground. Tall ruderal vegetation does not constitute an important ecological feature and its loss would be of negligible ecological significance.

4.7 Hard Standing

Description and Evaluation

4.7.1 Tracks within the site, associated with field boundaries and access to an off-site bird hide, comprise areas of hard standing. These areas are largely devoid of vegetation and of negligible ecological value.

4.8 Hedgerows and Tree Lines

Description

4.8.1 Several short lengths of hedgerow and a single tree line are present within the site. These features are described in Table 4.2 below.

Table 4.2. Hedgerow descriptions.

Ref	H	W	Woody species	Avg. per 30m*	Ground flora & climbers	Associated features	Likely to qualify#
H1	4m	2-3m	Hawthorn (D)	1	Bramble	Continuous	N
H2	2-4m	2-3m	Hawthorn, Blackthorn, Elder, Hazel	2-3	Bramble, Dog Rose	Continuous, no gaps. Outgrown within adjacent scrub	N
H3	4m	3m	Hawthorn (D), Elder	2	Bramble	Few gaps, tall ruderals adjacent and throughout	N
TL1			Oak, Sycamore	<2	Common Nettle	<10% gaps	N

Woody species (as listed under Schedule 3 of the Hedgerows Regulations 1997) and woodland ground flora species (as listed under Schedule 2 of the Hedgerows Regulations 1997) underlined, y = young, sm = semi-mature, m = mature, pv = possible veteran, B = bank, W = wall, br = bridleway, f/p = footpath, b/w = byway, (D) = dominant species

** estimated average number of woody species (as listed under Schedule 3 of the Hedgerows Regulations 1997) in any one 30m stretch*

 # likely to qualify – as 'important' under the wildlife and landscape criteria of the Hedgerows Regulations 1997

Evaluation

4.8.2 Hedges **H1-H3** are not species-rich[14] and none are likely to qualify as *Important* under the Hedgerows Regulations 1997, based on the number of woody species and other associated features present.

[14] Five or more native woody species within a 30m length (or four or more in Northern England) – FEP Manual

4.8.3 Hedgerows **H1-H3** are, however, likely to qualify as a Priority Habitat based on the standard definition[15], which includes all hedgerows (>20m long and <5m wide) consisting predominantly (≥80%) of at least one native woody species. It has been estimated that approximately 84% of countryside hedgerows in Great Britain qualify as Priority Habitat under this definition.[15] On this basis, hedgerows constitute important ecological features, although given their relative isolation from the wider network are only considered to be of importance at the local level.

4.8.4 Tree line **TL1** contains mature native trees within formal lines which are likely to provide some cover for use by wildlife. This tree line is therefore considered to be an important ecological feature at the local level.

4.9 Habitat Evaluation Summary

4.9.1 On the basis of the above, the following habitats within and adjacent to the site are considered to form important ecological features:

Table 4.3. Evaluation summary of habitats forming important ecological features.

Habitat	Level of Importance
Hedgerow and Tree Line	Local

4.9.2 Other habitats present within the site include rough, pasture and improved grassland, scrub tall ruderal vegetation and hardstanding. However, these habitats do not form important ecological features.

[15] Biodiversity Reporting and Information Group (2011) '*UK Biodiversity Action Plan (BAP) Priority Habitat Descriptions'*, ed. Ant Maddock

5 Faunal Use of the Site

5.1 Overview

5.1.1 During the survey work, general observations were made of faunal use of the site with particular attention paid to the potential presence of protected or notable species. Specific surveys and assessments were undertaken in respect of Badgers, bats, Otter and Water Vole as described below.

5.1.2 Surveys for birds and reptiles have also been undertaken at the site and these are documented in separate reports.

5.2 Priority Species

5.2.1 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. In particular, Section 41 of the NERC Act requires the Secretary of State to publish a list of species which are of principal importance for conservation in England. This list is largely derived from the 'Priority Species' listed under the former UK Biodiversity Action Plan (BAP), which continue to be regarded as priority species under the subsequent country-level biodiversity strategies.

5.2.2 During the survey work undertaken, no Priority Species were recorded within the site. This is discussed further below.

5.3 Bats

5.3.1 **Legislation.** All British bats are listed as European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended) and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). As such, bats and their roosts (breeding sites and resting places) receive full protection under the legislation (see Appendix 6322/3 for detailed provisions). If works are likely to result in an offence a licence may need to be obtained from Natural England which would be subject to appropriate measures to safeguard bats. Given all bats are protected species, they are considered to represent important ecological features. A number of bat species are also S41 Priority Species.

5.3.2 **Background Records.** No records of bats from within or adjacent to the site were returned from the data search. Data from within 2km of the site included records of Pipistrelle *Pipistrellus* sp., Daubenton's Bat *Myotis daubentonii*, and Whiskered Bat *Myotis mystacinus.*

5.3.3 **Survey Results and Evaluation**

Roosting

Trees

5.3.4 No trees are present within the site that contain potential bat roosting features or have the potential to support roosting bats.

Foraging / Commuting

5.3.5 The habitats present on site include rough grassland and scrub that may potentially be used by foraging bats, although connectivity with suitable areas of habitat off-site is limited. It is possible that the adjacent railway corridor may offer some connectivity and foraging

potential for bats, as might the River Dee corridor, although as it comprises a large open estuarine area any bat activity is likely to be limited. Lighting from the power station and the town of Connah's Quay is anticipated to further limit the suitability of the area to provide important features used by bats.

5.4 Badger

5.4.1 **Legislation.** Badger receive legislative protection under the Protection of Badgers Act 1992 (see Appendix 6322/3 for detailed provisions), and as such should be assessed as an important ecological feature. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status; Badger is common throughout most of Britain. It is the duty of planning authorities to consider the conservation and welfare impacts of development upon Badger and issue permissions accordingly.

5.4.2 Licences can be obtained from Natural England for development activities that would otherwise be unlawful under the legislation. Guidance on the types of activity that should be licensed is laid out in the relevant best practice guidance. [16, 17]

5.4.3 **Background Records.** Records for Badger were returned from within 2km of the site, although precise locations are unspecified.

5.4.4 [redacted]

5.4.5

5.5 Dormouse

5.5.1 **Legislation.** Dormouse is fully protected under the Wildlife and Countryside Act 1981 (as amended) and is a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended). Such legislation affords protection to individuals of the species and their breeding sites and places of rest (see Appendix 6322/3 for detailed provisions). Dormouse is also a S41 Priority Species. On this basis, Dormouse is considered to form an important ecological feature.

5.5.2 **Background Records.** No records of Dormouse were returned from the local record centre from within 2km of the site.

5.5.3 **Survey Results and Evaluation.** The site is close to the limits of the known UK distribution of this species. Habitats present provide very limited opportunities for Dormouse, restricted to scrub but this habitat lacks the structure and preferred species such as Hazel *Corylus avellana* and Honeysuckle *Lonicera periclymenum*. The site also lacks connectivity with offsite habitats, being isolated by the River Dee to the north and east, and development to the west and south.

[16] English Nature (2002) '*Badgers and Development*'
[17] Natural England (2011) '*Badgers and Development: A Guide to Best Practice and Licensing*', Interim Guidance Document

5.5.4 The lack of connectivity and limited suitability, combined with the lack of local records and the UK location of the site, indicates that Dormouse is likely to be absent from the site.

5.6 Otter and Water Vole

5.6.1 **Legislation.** Otter is fully protected under the Wildlife and Countryside Act 1981 (as amended) and is a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended). Such legislation affords protection to individuals of the species and their breeding sites and places of rest (see Appendix 6322/3 for detailed provisions). Otter is also a S41 Priority Species. On this basis, Otter is considered to represent an important ecological feature.

5.6.2 Water Vole is also fully protected under the Wildlife and Countryside Act 1981 (as amended). Water Vole is also a S41 Priority Species. As such, this species is considered to represent an important ecological feature. The legislation affords protection to individuals of the species and their breeding sites and places of shelter (see Appendix 6322/3 for detailed provisions).

5.6.3 If, despite all reasonable efforts, properly authorised development will adversely affect Water Vole and there are no alternative habitats nearby, Natural England may issue a licence to displace or trap and translocate Water Vole for the purpose of development. To issue such a licence, Natural England would need to be assured there is no reasonable alternative to the development and that there are no other practical solutions that would allow Water Vole to be retained at the same location. Natural England would also require no net loss of Water Vole habitat resulting from the works.

5.6.4 **Background Records.** Several records of Otter and Water Vole were returned from within 2km of the site. Two records of Water Vole originated from a site North of the River Dee and three records of Otter were associated with the River Dee itself.

5.6.5 **Survey Results and Evaluation.** The habitats within the site itself are unsuitable for Otter and Water Vole, however the offsite adjacent River Dee Estuary provides highly suitable foraging and commuting habitat for Otter with potential for resting sites. These potential resting sites are relatively distant from the site itself.

5.6.6 The River Dee Estuary does not provide suitable habitat for Water Vole which favours smaller, more densely vegetated watercourses.

5.6.7 Targeted surveys for evidence of Otter and Water Vole were undertaken at the site in August 2021 and again in April 2023. No evidence of Otter or Water Vole was found during any of the surveys undertaken and it is concluded that neither species currently makes use of habitats within the site. Nevertheless, it is highly likely that Otter make use of the corridor of the River Dee and its fringing habitats outside the site boundary.

5.7 Other Mammals

5.7.1 **Legislation.** Other native UK mammals receive protection against acts of cruelty (e.g. under the Wild Mammals (Protection) Act 1996). Additionally, some are S41 Priority Species and should therefore be assessed as important ecological features.

5.7.2 **Background Records.** Records of Hedgehog *Erinaceus europaeus* (Priority Species), Stoat *Mustela erminea* and Brown Hare *Lepus europaeus* were returned from within 2km of the site.

5.7.3 **Survey Results and Evaluation.** No evidence of any other protected, rare or notable mammal species was recorded within the site. Other mammal species likely to make use of the site, such as Fox *Vulpes vulpes*, remain common in both a local and national context. As such, these species are not a material planning consideration and the loss of potential opportunities for these species would be of negligible significance.

5.7.4 The data search returned background records of Hedgehog within the surrounding area. Hedgehog is a Priority Species, albeit one that remains common and widespread in England. The site offers potential opportunities for this species, particularly in the form of areas of scrub, tall ruderal vegetation and grassland, and therefore it is likely that Hedgehog uses the site, and as such is assessed as of importance at the site level.

5.8 Amphibians

5.8.1 **Legislation.** All British amphibian species receive a degree of protection under the Wildlife and Countryside Act 1981 (as amended). Great Crested Newt is protected under the Act and is also classed as a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended). As such, both Great Crested Newt and habitats utilised by this species are afforded protection (see Appendix 6322/3 for detailed provisions). Great Crested Newt is also a S41 Priority Species, as are Common Toad *Bufo bufo*, Natterjack Toad *Epidalea calamita*, and Pool Frog *Pelophylax lessonae*. As such, these species should be assessed as important ecological features.

5.8.2 **Background Records.** No specific records of amphibians from within or adjacent to the site were returned by the data search. Three records of Smooth Newt *Lissotriton vulgaris* were returned from within 2km of the site.

5.8.3 **Survey Results and Evaluation.** Three ponds are present within field **F1** outside the site, two of which contained water at the time of the survey. These ponds are all heavily used by waterfowl and are highly unlikely to support breeding Great Crested Newt given this and the lack of connectivity with off-site ponds. Additionally, one other pond and a number of drainage ditches are present within 250m of the site boundary, although these are separated from site by the railway line.

5.8.4 The Dee Estuary SAC/SPA/Ramsar site lists a breeding population of Natterjack Toad *Epidalea calamita* as a qualifying species. However, this is a reintroduced population that is restricted to the Gronant Dunes and Talacre Warren SSSI, located 19.5km north-west of the site. As such, given the distance from the known population and the lack of suitable Natterjack Toad habitat present within the site, Natterjack Toad is considered to be absent from the site.

5.8.5 A single Common Toad *Bufo bufo* was recorded at one survey location during the reptile surveys.

5.9 Invertebrates

5.9.1 **Legislation.** Several invertebrate species are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). In addition, Large Blue Butterfly *Maculinea arion*, Fisher's Estuarine Moth *Gortyna borelii lunata* and Lesser Whirlpool Ramshorn Snail *Anisus vorticulus* receive protection under the Conservation of Habitats and Species Regulations 2017 (as amended); see Appendix 6322/3 for detailed provisions. A number of invertebrates are also S41 Priority Species. Where such species are present, they should be assessed as important ecological features.

5.9.2 **Background Records.** No records of invertebrates were returned from within or adjacent to the site. A number of records of Wall *Lasiommata megera*, Small Heath *Coenonympha pamphilus*, Autumnal Rustic *Eugnorisma glareosa*, Garden Dart *Euxoa nigricans*, White-line Dart *Euxoa tritici*, Oak Hook-tip *Watsonalla binaria*, White Ermine *Spilosoma lubricipeda*, Buff Ermine *Spilosoma lutea*, Blood-vein *Timandra comae* and Cinnabar *Tyria jacobaeae* (Priority Species) were returned from Cofnod from within 2km of the site.

5.9.3 **Survey Results and Evaluation.** No evidence of the presence of any protected, rare or notable invertebrate species was recorded within the site. The site contains relatively few micro-habitats that would typically indicate elevated potential for invertebrates[18], such as a variable topography with areas of vertical exposed soil, areas of species-rich semi-natural vegetation; variable vegetation structure with frequent patches of tussocks combined with short turf; free-draining light soils; walls with friable mortar or fibrous dung. Accordingly, given the habitat composition of the site and lack of adjacent sites designated for significant invertebrate interest, it is considered unlikely that significant protected, rare or notable invertebrate populations are present, and the site is unlikely to support an important invertebrate assemblage.

5.10 Summary

5.10.1 On the basis of the above, a summary of the evaluation of fauna is provided below:

Table 5.1: Evaluation summary of fauna forming important ecological features.

Species / Group	Supported by or associated with the site	Level of Importance
[redacted]		
Otter	Likely commuting habitat offsite	Negligible
Hedgehog	Local records of presence; suitable habitat on site	Site

[18] Natural England (2010) 'Higher Level Stewardship – Farm Environment Plan (FEP) Manual', 3rd Edition

6 Conclusions

6.1.1 Aspect Ecology has carried out baseline ecological surveys at the Connah's Quay Power Station Northern Land Parcel, based on the results of a desk study and ecological surveys of the site.

6.1.2 The available information confirms that a statutory nature conservation designation is present immediately adjacent to the site in the form of the Dee Estuary SPA/Ramsar/SAC.

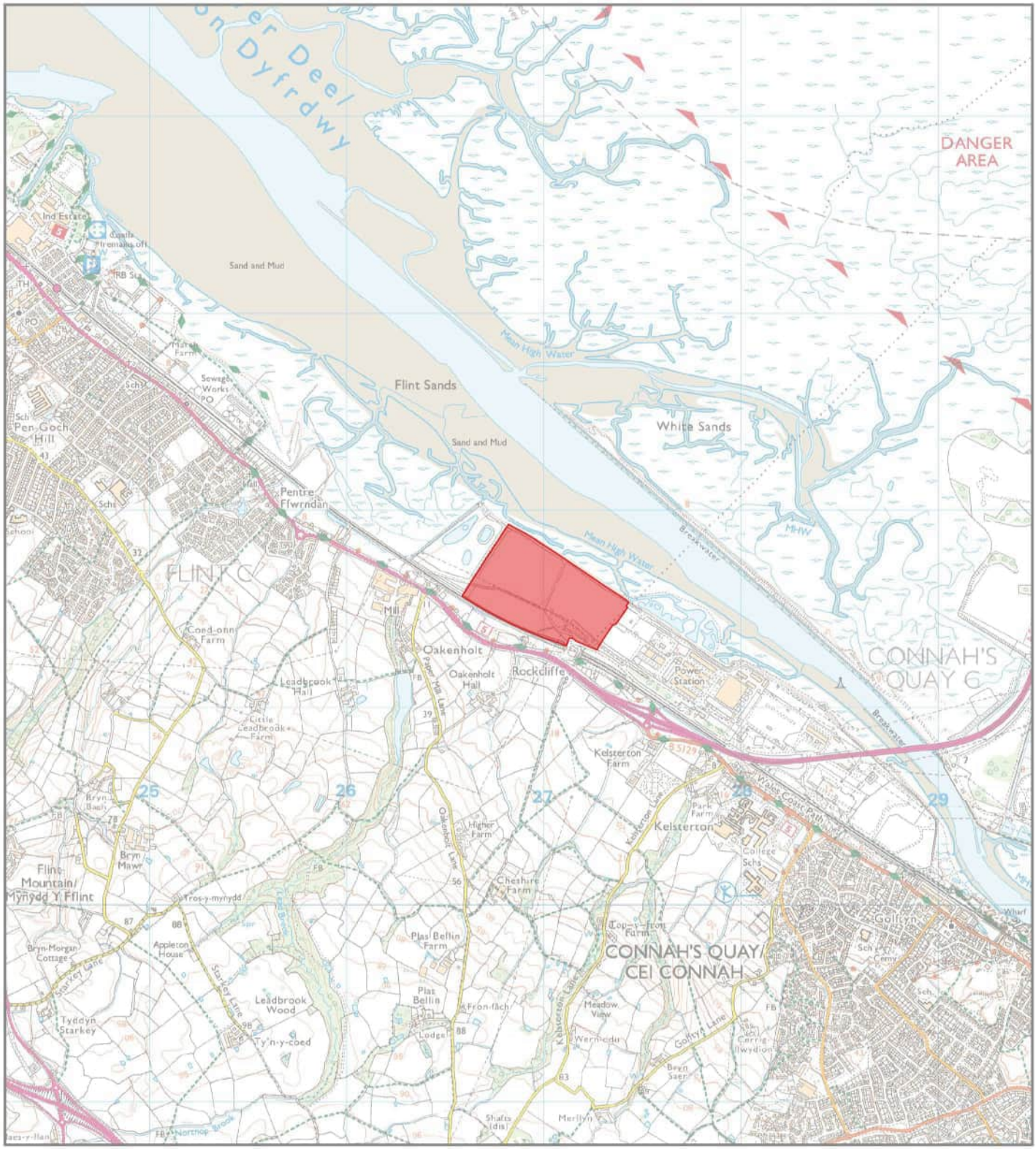
6.1.3 The surveys undertaken have shown that the site is dominated by habitats of low ecological importance. Hedgerows are of higher importance and are likely to qualify as Priority Habitat.

6.1.4 [redacted]

6.1.5 Studies undertaken at the site in respect of reptiles and birds are reported separately.

Plan 6322/ECO1:

Site Location



Key:

Site Location

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Connah's Quay (North)	PROJECT
Site Location	TITLE
6322/ECO1	DRAWING NO.
B/JP	REV
September 2023	DATE

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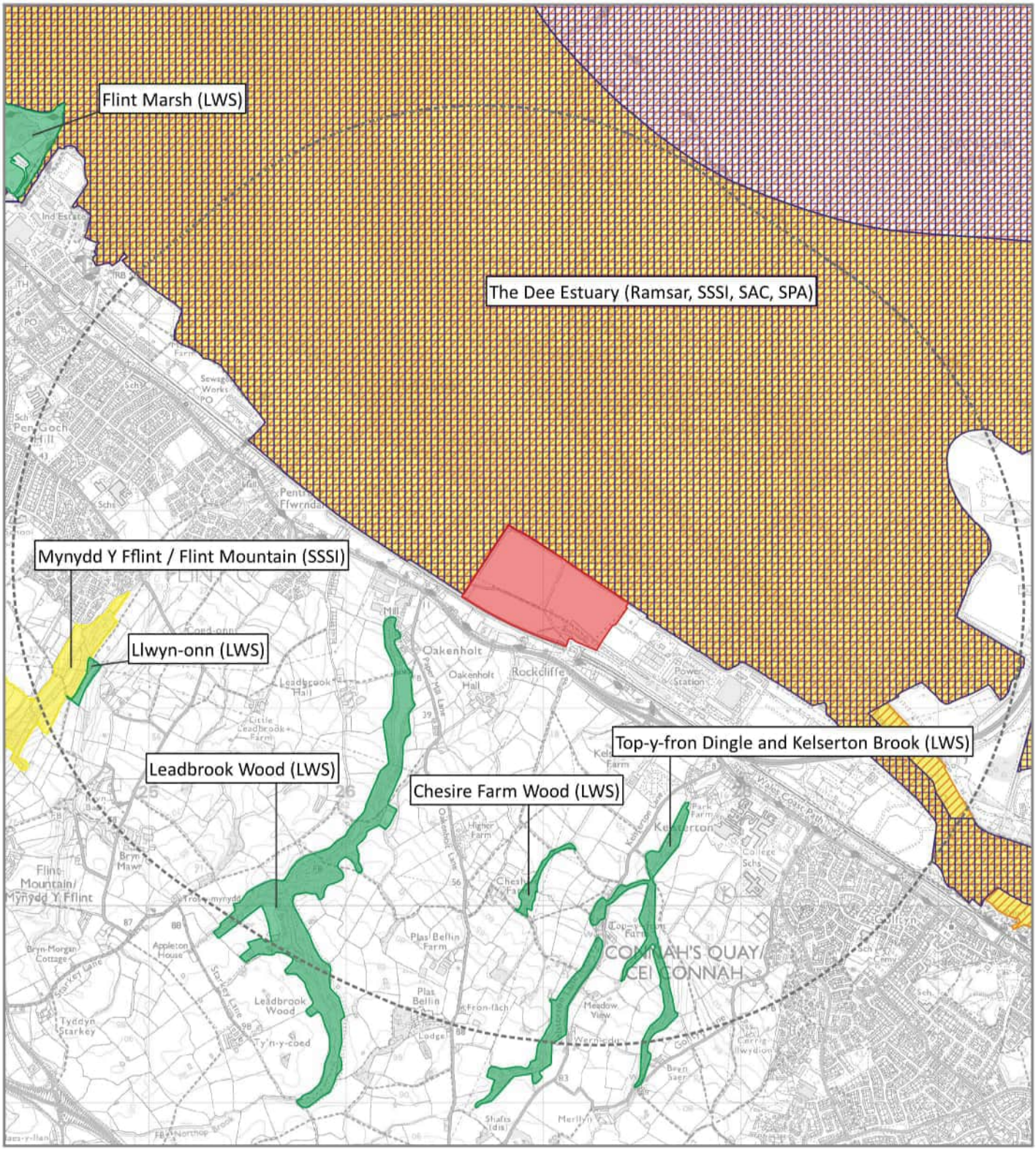
Plan 6322/ECO2:

Ecological Designations



Key:

- Site Location
- 2km Study Area
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Local Wildlife Site (LWS)

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Plan 6322/ECO3:

Habitats and Ecological Features

Key:

- Site Boundary
- Rough Grassland
- Improved Grassland
- Pasture
- Marshy Grassland
- Tall Ruderal Vegetation
- Scattered Scrub
- Dense Scrub
- Pond
- Reed Bed/Rush
- Hedgerow
- Tree Line
- Hardstanding

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Appendix 6322/1:

Desk Study Data

EC Directive 79/409 on the Conservation of Wild Birds: Citation for Special Protection Area (SPA)

Name: The Dee Estuary

Unitary Authority/County: Cheshire West and Chester, Denbighshire, Flintshire, Wirral.

Boundary of the SPA: The Dee Estuary SPA encompasses the Dee Estuary/Aber Afon Dyfrdwy Site of Special Scientific Interest (SSSI); the dunes and intertidal foreshore at Gronant Dunes and Talacre Warren SSSI; the freshwater marsh at Inner Marsh Farm SSSI; and the lagoons and reedbeds at Shotton Lagoons and Reedbeds. The boundary of the SPA is shown on the map enclosed.

Site description: The Dee Estuary lies on the border between England and Wales on the north-west coast of Britain. It is a large, funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. Where agricultural reclamation has not occurred, the saltmarshes grade into transitional brackish and swamp vegetation on the upper shore. The site also includes the three sandstone islands of Hilbre, with their important cliff vegetation and maritime heathland and grassland. The two shorelines of the estuary show a marked contrast between the industrialised usage of the coastal belt in Wales and residential and recreational usage in England. The site is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders; in summer the site supports nationally important breeding colonies of two species of tern. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for Sandwich terns post-breeding.

Size of SPA: 14,291.56 ha.

European ornithological interest of SPA:

Qualifying species:
The site qualifies under **Article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex I species	Count and Season	Period	% of GB population
Bar-tailed Godwit *Limosa lapponica*	1,150 individuals - wintering	5 year peak mean 1994/95 - 1998/99	2.2%
Common Tern *Sterna hirundo*	392 pairs - breeding	5 year mean 1995 – 1999	3.2%
Little Tern *Sterna albifrons*	69 pairs – breeding	5 year mean 1995 - 1999	2.9%
Sandwich Tern *Sterna sandvicensis*	957 individuals- autumn passage	5 year mean 1995 - 1999	2.3%

The site qualifies under **Article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	**Count and Season**	**Period**	**% of population**
Redshank *Tringa totanus*	8,795 individuals - passage	5 year mean 1994/95 – 1998/99	5.9% Eastern Atlantic (wintering)
Shelduck *Tadorna tadorna*	7,725 individuals - wintering	5 year mean 1994/95 - 1998/99	2.6% Northwestern Europe
Teal *Anas crecca*	5,251 individuals - wintering	5 year mean 1994/95 - 1998/99	1.3% Northwestern Europe
Pintail *Anas acuta*	5,407 individuals - wintering	5 year mean 1994/95 - 1998/99	9.0% Northwestern Europe
Oystercatcher *Haematopus ostralegus*	22,677 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Europe & N/W Africa (wintering)
Grey Plover *Pluvialis squatarola*	1,643 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Eastern Atlantic (wintering)
Knot *Calidris canutus islandica*	12,394 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% NE Can/Grl/ Iceland/NW Eur
Dunlin *Calidris alpina*	27,769 individuals - wintering	5 year mean 1994/95 - 1998/99	2.0% N Siberia/Europe/ W Africa
Black-tailed Godwit *Limosa limosa islandica*	1,747 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Iceland (breeding)
Curlew *Numenius arquata*	3,899 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Europe (breeding)
Redshank *Tringa totanus*	5,293 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% Eastern Atlantic (wintering)

Assemblage qualification
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 120,726 individual waterbirds (5 year peak mean 1994/95 - 1998/99), including: Great Crested Grebe *Podiceps cristatus*, Cormorant *Phalacrocorax carbo*, Shelduck *Tadorna tadorna*, Wigeon *Anas penelope*, Teal *Anas crecca*, Pintail *Anas acuta*, Oystercatcher *Haematopus ostralegus*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*, Sanderling *Calidris alba*, Dunlin *Calidris alpina*, Black-tailed Godwit *Limosa limosa islandica*, Bar-tailed Godwit *Limosa lapponica*, Curlew *Numenius arquata* and Redshank *Tringa totanus*.

Non-qualifying species of interest: Leach's Petrel *Oceanodroma leucorhoa*, Little Egret *Egretta garzetta*, Bewick's Swan *Cygnus columbianus bewickii*, Whooper Swan *Cygnus cygnus*, Smew *Mergellus albellus*, Hen Harrier *Circus cyaneus*, Merlin *Falco columbarius*, Peregrine *Falco peregrinus*, Golden Plover *Pluvialis apricaria*, Ruff *Philomachus pugnax*, Wood Sandpiper *Tringa glareola*, Short-eared Owl *Asio flammeus* and Kingfisher *Alcedo atthis* (all Annex 1 species) occur in non-breeding numbers of less than European importance (less than 1% of the GB population).

Status of SPA:
The Dee Estuary was first classified as a Special Protection Area on 17 July 1985. The boundaries and site features were revised on 10 December 2009.

European Site Conservation Objectives for The Dee Estuary Special Protection Area Site Code: UK9013011

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying Conservation Advice document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
A052 *Anas crecca*; Eurasian teal (Non-breeding)
A054 *Anas acuta*; Northern pintail (Non-breeding)
A130 *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A160 *Numenius arquata*; Eurasian curlew (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding)
A193 *Sterna hirundo*; Common tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage

This is a cross border site

This site crosses the border between England and Wales. Some features may only occur in one Country. The advice of Natural Resources Wales should therefore be sought separately.

This is a European Marine Site

This SPA is a part of the Dee Estuary European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS.

Natural England's formal Conservation Advice for European Marine Sites can be found via GOV.UK.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 4). This document updates and replaces an earlier version dated 5 February 2016 to reflect the consolidation of the Habitats Regulations in 2017.

Special Areas of Conservation

Dee Estuary/ Aber Dyfrdwy

Designated Special Area of Conservation (SAC)

Country	England/Wales
Unitary Authority	Cheshire, East Wales, Extra-Regio, Merseyside, West Wales and The Valleys
Centroid*	SJ191819
Latitude	53.32833333
Longitude	-3.216111111
SAC EU Code	UK0030131
Status	Designated Special Area of Conservation (SAC)
Area (ha)	15805.27

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

Location of Dee Estuary/ Aber Dyfrdwy SAC

General site character

- Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins) (81.8%)
- Salt marshes, Salt pastures, Salt steppes (16.1%)
- Coastal sand dunes, Sand beaches, Machair (0.7%)
- Shingle, Sea cliffs, Islets (0.5%)
- Bogs, Marshes, Water fringed vegetation, Fens (0.4%)
- Humid grassland, Mesophile grassland (0.2%)
- Improved grassland (0.1%)
- Broad-leaved deciduous woodland (0.1%)
- Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (0.1%)

Download the Standard Data Form for this site as submitted to Europe (PDF <100kb)

Note When undertaking an appropriate assessment of impacts at a site, all features of European importance (both primary and non-primary) need to be considered.

Annex I habitats that are a primary reason for selection of this site

- **1140 Mudflats and sandflats not covered by seawater at low tide**
  Species occurrence description not yet available.

- **1310 Salicornia and other annuals colonizing mud and sand**

  The Dee Estuary is representative of pioneer glasswort *Salicornia* spp. saltmarsh in the north-west of the UK. *Salicornia* spp. saltmarsh forms extensive stands in the Dee, especially on the more sandy muds where there is reduced tidal scour. It mainly occurs on the seaward fringes as a pioneer community, and moving landwards usually forms a transition to common saltmarsh-grass *Puccinellia maritima* saltmarsh (SM10). There is also a low frequency of *Salicornia* spp. extending well inland. Associated species often include annual sea-blite *Suaeda maritima* and hybrid scurvy grass *Cochlearia x hollandica*.

- **1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
  The Dee Estuary is representative of **H1330 Atlantic salt meadows** in the north-west of the UK. It forms the most extensive type of saltmarsh in the Dee, and since the 1980s it has probably displaced very large quantities of the non-native common cord-grass *Spartina anglica*. The high accretion rates found in the estuary are likely to favour further development of this type of vegetation. The saltmarsh is regularly inundated by the sea; characteristic salt-tolerant perennial flowering plant species include common saltmarsh-grass *Puccinellia maritima*, sea aster *Aster tripolium*, and sea arrowgrass *Triglochin maritima*. In a few areas there are unusual transitions to wet woodland habitats.

Annex I habitats present as a qualifying feature, but not a primary reason for

selection of this site

- **1130 Estuaries**
- **1210 Annual vegetation of drift lines**
- **1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts**
- **2110 Embryonic shifting dunes**
- **2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"**
- **2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" * Priority feature**
- **2190 Humid dune slacks**

Annex II species that are a primary reason for selection of this site

- Not Applicable

Annex II species present as a qualifying feature, but not a primary reason for site selection

- **1095 Sea lamprey** *Petromyzon marinus*
- **1099 River lamprey** *Lampetra fluviatilis*
- **1395 Petalwort** *Petalophyllum ralfsii*

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

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EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	River Dee and Bala Lake
Unitary Authority/County:	Cheshire, Denbighshire, Flintshire, Gwynedd, Shropshire, Wrexham
SAC status:	English part designated on 1 April 2005 Welsh part designated on 13 December 2004
Grid reference:	SJ422503
SAC EU code:	UK0030252
Area (ha):	1308.93
Component SSSI:	Afon Dyfrdwy (River Dee) SSSI, Llyn Tegid SSSI, River Dee (England) SSSI

Site description:

The River Dee has its source in Snowdonia at the outflow of Llyn Tegid and it includes the Ceiriog, Meloch, Tryweryn and Mynach tributaries. Its catchment contains a wide spectrum of landscape from high mountains around Bala, rugged peaks near Llangollen, steep sided wooded valleys, and the plains of Cheshire, Flintshire, north Shropshire and Wrexham. There is a tidal influence as far upstream as Farndon and high tides regularly exceed the Chester weir crest level.

The aquatic plant community includes Wirtgen's water-crowfoot *Ranunculus x bachii* and pond water-crowfoot *R. peltatus*, and also floating water-plantain *Luronium natans*. Water-crowfoot forms extensive beds along the whole length of the Dee where flow conditions are suitable. Other aquatic plants which occur within the site include intermediate water-starwort *Callitriche hamulata*, alternate-flowered water-milfoil *Myriophyllum alterniflorum* and bryophytes including *Rhynchostegium riparoides* and *Fontinalis antipyretica.* Marginal vegetation consists mainly of reed canary-grass *Phalaris arundinacea* with occasional branched bur-reed *Sparganium erectum*.

There is good tree cover along the banks of the River Dee and the tributaries, with the Ceiriog being tree lined on both banks along much of its length. The dominant species are alder *Alnus glutinosa* and willow *Salix* spp., with occasional ash *Fraxinus excelsior* and oak *Quercus* spp. Where sections of the riverbank have been fenced off the vegetation tends to be dominated by bramble *Rubus fruticosus* agg., nettles *Urtica dioica* and other tall ruderals.

The River Dee is recognised as one of North Wales' premier rivers for Atlantic salmon *Salmo salar*. The Mynach, Meloch and Ceiriog tributaries are the most important salmon spawning tributaries in the Dee catchment. Other migratory fish utilising the river system include river lamprey *Lampetra fluviatilus* and sea lamprey *Petromyzon marinus*. The Dee also supports important populations of non-migratory fish including bullhead *Cottus gobio* and brook lamprey *Lampetra planeri*. The otter *Lutra lutra* is well established throughout the river system, especially where appropriate bank side cover exists.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot)

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Atlantic salmon *Salmo salar*
- Brook lamprey *Lampetra planeri*
- Bullhead *Cottus gobio*
- Floating water-plantain *Luronium natans*
- Otter *Lutra lutra*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0030252
Date of registration: 14 June 2005

Signed: [redacted]

On behalf of the Secretary of State for Environment, Food and Rural Affairs

The site is also entered in the Register of European sites for Wales, maintained by the National Assembly for Wales.

European Site Conservation Objectives for River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid Special Area of Conservation Site code: UK0030252

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats and habitats of qualifying species**
- **The structure and function (including typical species) of qualifying natural habitats**
- **The structure and function of the habitats of qualifying species**
- **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**
- **The populations of qualifying species, and,**
- **The distribution of qualifying species within the site.**

This document should be read in conjunction with the accompanying Supplementary Advice document (where available), which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H3260. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; Rivers with floating vegetation often dominated by water-crowfoot

S1095. *Petromyzon marinus*; Sea lamprey

S1096. *Lampetra planeri*; Brook lamprey

S1099. *Lampetra fluviatilis*; River lamprey

S1106. *Salmo salar*; Atlantic salmon

S1163. *Cottus gobio*; Bullhead

S1355. *Lutra lutra*; Otter

S1831. *Luronium natans*; Floating water-plantain

This is a cross border site

This site crosses the border between England and Wales. Some features may only occur in one Country. The advice of Natural Resources Wales should therefore be sought separately.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 4). This document updates and replaces an earlier version dated 5 February June 2016 to reflect the consolidation of the Habitats Regulations in 2017.

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

FLINTSHIRE **MYNYDD Y FFLINT/FLINT MOUNTAIN**

Date of Notification: 19 May 2011

National Grid Reference: SJ 243709

OS Maps: 1:50,000 Sheet number: 116
1:10,000 Sheet number: SJ27SW

Site Area: 25.79ha

Description

The site is of special interest for its stands of unimproved neutral grassland and semi-natural broadleaved woodland, which occur in association with scrub, fen-meadow and swamp vegetation. Mynydd y Fflint/Flint Mountain SSSI is located 1km to the south of Flint, north of the village of Flint Mountain, at an altitude ranging from 35 - 70m.

The site follows the course of a brook within a valley with gentle slopes extending on either side. The slopes are free draining, with the underlying geology consisting of mudstones of the Upper Carboniferous Period, which are overlain by mostly till with some glacial sands and gravels.

The neutral grassland areas on the drier slopes are of high floristic quality and hold a range of grasses, including red fescue *Festuca rubra*, sweet vernal-grass *Anthoxanthum odoratum*, common bent *Agrostis capillaris*, Yorkshire fog *Holcus lanatus*, and crested dog's-tail *Cynosurus cristatus*. Herbs are prominent, with frequent to abundant common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata* and red clover *Trifolium pratense*, and frequent field woodrush *Luzula campestris* and bulbous buttercup *Ranunculus bulbosus*. Some notable plants include pale flax *Linum bienne* and an inland population of rest harrow *Ononis repens*.

Alder *Alnus glutinosa* with grey willow *Salix cinerea* dominates the large areas of semi-natural broadleaved woodland found mainly along the valley bottom. The ground flora varies greatly with areas dominated by great horsetail *Equisetum telmateia* with extensive beds of lesser pond sedge *Carex acutiformis* with scattered marsh willowherb *Epilobium palustre*; whilst other areas have frequent ivy *Hedera helix* with bramble *Rubus fruticosus* and yellow archangel *Lamiastrum galeobdolon*.

In places the vegetation grades into swamp dominated by lesser pond sedge *Carex acutiformis*, with scattering of associates such as water mint *Mentha aquatica*, great willowherb *Epilobium hirsutum*, marsh horsetail *Equisetum palustre*, and marsh marigold *Caltha palustris*. This in turn gives way to areas of rich mixed fen with the addition of the locally uncommon greater tussock sedge *Carex paniculata* and sneezwort *Achillea ptarmica*. Some notable associated species in this vegetation included figwort *Scrophularia nodosa*, and hemp agrimony *Eupatorium*

cannabinum.

The transition between the vegetation communities is well developed with small areas of fen-meadow dominated by the locally uncommon blunt flowered rush *Juncus subnodulosus* accompanied by fen bedstraw *Galium uliginosum*, angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria*, marsh valerian *Valeriana dioica* and marsh thistle *Cirsium palustr*e. Mynydd y Fflint/Flint Mountain is only the second known site for this fen-meadow community in the North East Wales.

The site also supports a variety of other semi-natural vegetation types including areas bracken, scrub and other broadleaved woodland communities.

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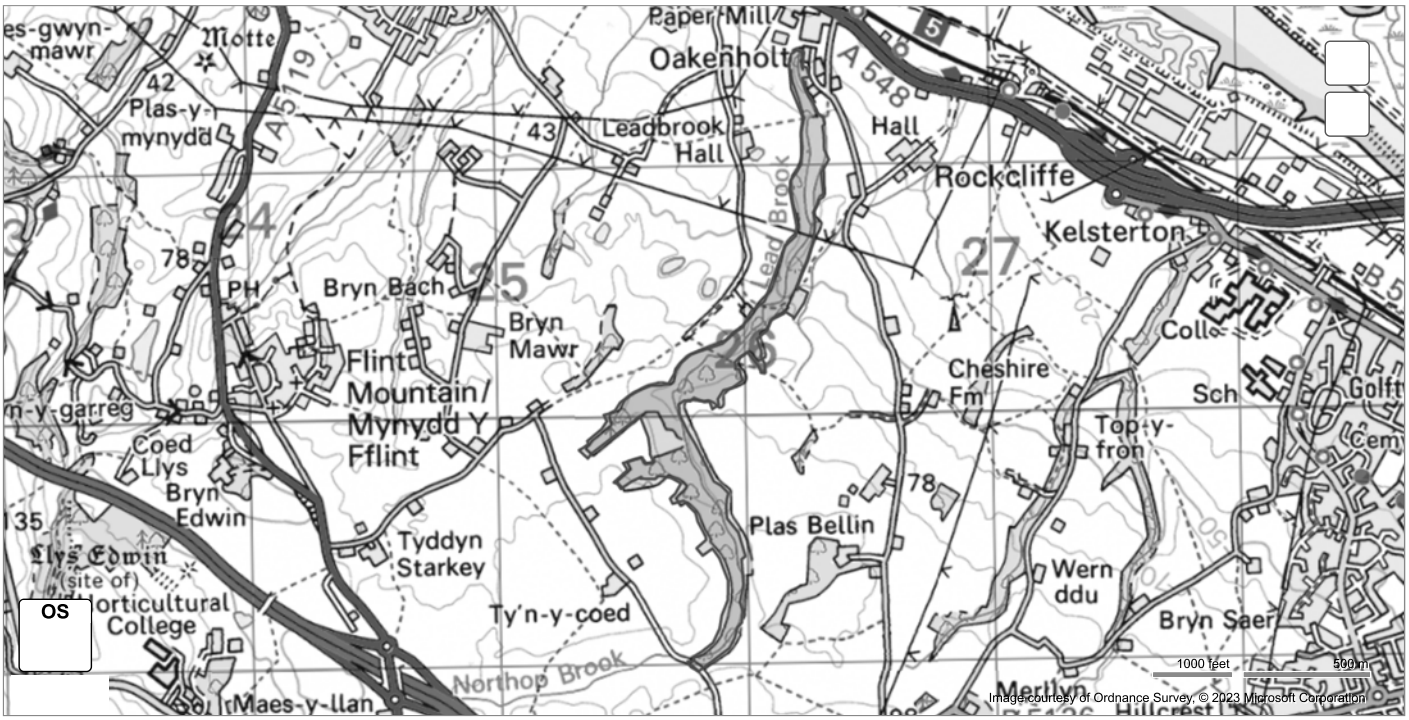
Safleol

A Local Sites System for Wales

26NE10: Leadbrook Wood

Location:	Flintshire
Centroid Grid Reference:	SJ259701
Area:	35.1 ha
Site Description:	Semi-natural broad-leaved woodland occupying the dingles in which the Lead Brook and its tributaries flow. In several areas drainage is impeded. The woodland canopy is mainly dominated by ash and sycamore with some oak alder, beech, common lime and silver birch. The shrub layer has abundant holly, hazel and wych elm. Also present are hawthorn and grey willow. The ground flora has frequent dog's mercury, bramble, wood anemone, enchanter's nightshade, bluebell, opposite-leaved golden saxifrage and wood speedwell. In wet areas of the southern part of the wood, marsh marigold, giant horsetail and meadowsweet are prominent. The northern tip of the woodland is mixed. In the north, the woodland surrounds a reservoir and alder and oak are dominant with hemlock water-dropwort, yellow flag and figwort. Near Ty'n-y-coed there is a semi-improved and a species-rich marshy grassland, with oval sedge, ragged robin, common spotted orchid, sharp-flowered rush, cuckoo flower, carnation sedge and meadowsweet. On the slope above this is a herb-rich meadow with pignut, black knapweed, cat's-ear, crested dog's tail and sweet vernal grass.
Habitats:	Broad-leaved semi-natural woodland (30.241 ha), Mixed plantation (1.57 ha), Semi-improved neutral grassland (0.721 ha), Marsh/marshy grassland (0.438 ha), Swamp (0.278 ha), Standing water (1.945 ha)
Designation Reason:	Broad-leaved woodland and scrub, Pasture/meadow and scrub

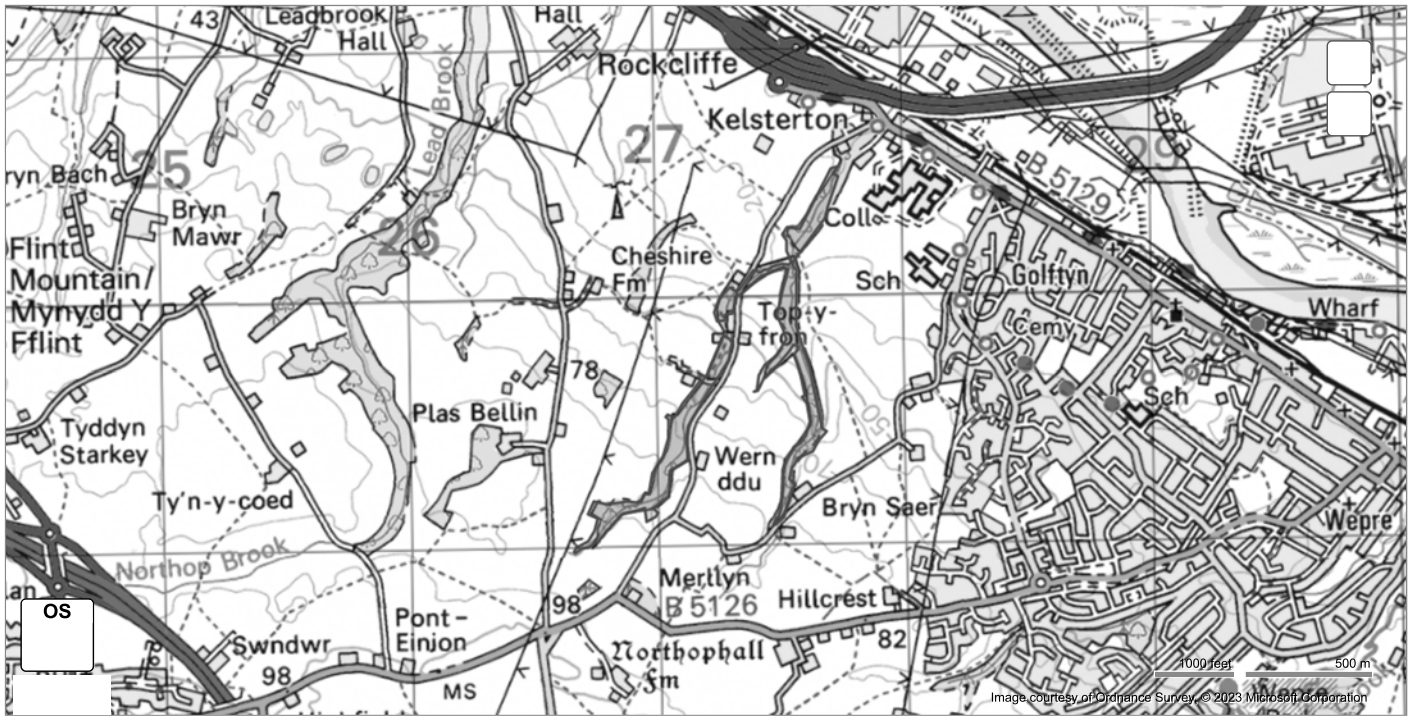


Safleol

A Local Sites System for Wales

26NE09: Top-y-fron Dingle and Kelserton Brook

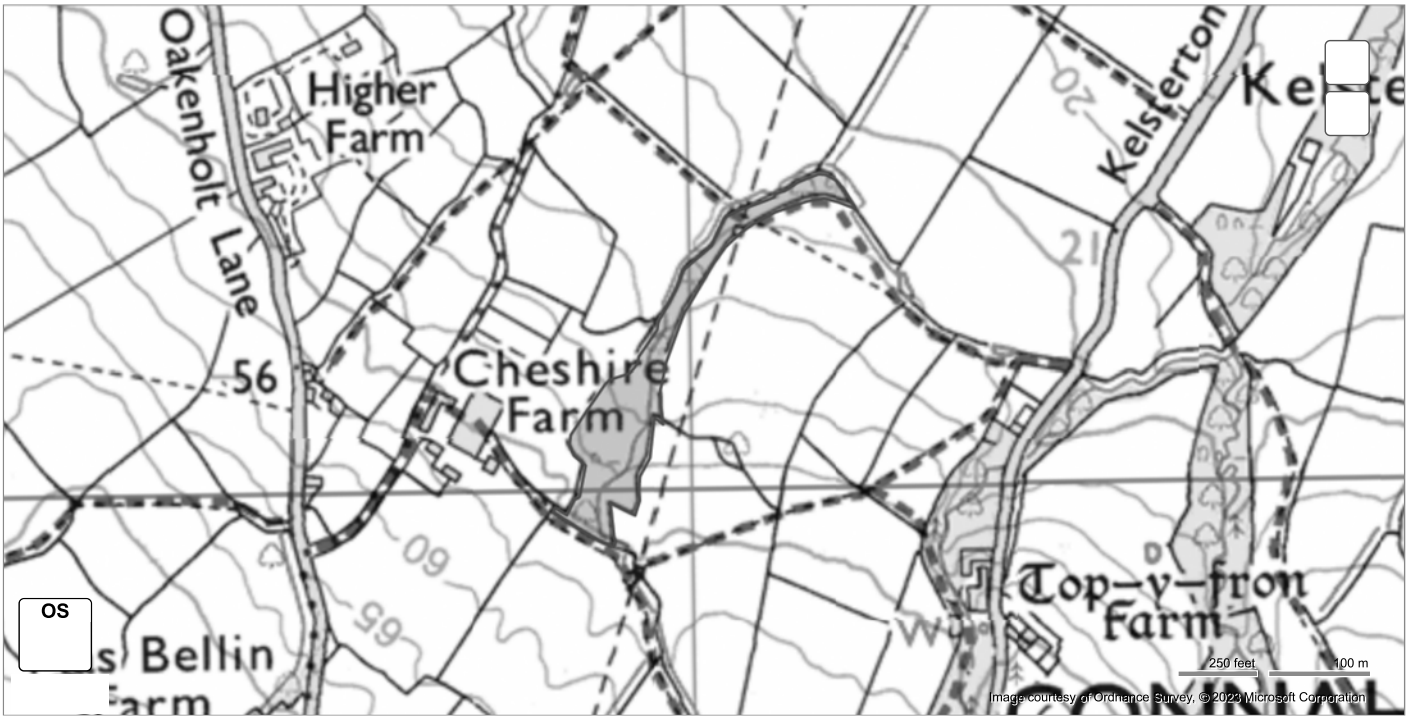
Location:	Flintshire
Centroid Grid Reference:	SJ273696
Area:	16.4 ha
Site Description:	Semi-natural broad-leaved woodland occupying two narrow steep-sided steam valleys that join into one south of Kelsterton. The dominant woodland canopy species is sycamore, but sessile oak, alder, ash and birch are all locally dominant. The Kelsterton Brook section also has common lime and yew. The shrub layer is variable. Top-y-Fron Dingle has a shrub layer of holly, hazel, elder and canopy saplings. The northern section of Kelsterton Brook lacks a shrub layer and the southern section has abundant elder but rhododendron and other introduced species are locally dominant. There is a rich herb flora. In Top-y-Fron Dingle bramble, ramsons, opposite-leaved golden saxifrage, dog's mercury, wood sorrel and bryophytes are all frequent. The herb layer in the Kelsterton Dingle has frequent wood speedwell, dog's mercury, red campion with some nettle, bramble, bluebell, ramsons and rough meadow-grass. The northern part is dominated by rough meadow-grass.
Habitats:	Broad-leaved semi-natural woodland (16.335 ha)
Designation Reason:	Broad-leaved woodland and scrub



Safleol
A Local Sites System for Wales

27SE01: Cheshire Farm Wood

Location:	Flintshire
Centroid Grid Reference:	SJ269701
Area:	1.6 ha
Site Description:	Semi-natural broad-leaved woodland following the course of a small stream. The woodland canopy is dominated by sessile oak with some beech, sycamore and ash. The shrub layer contains wych elm, hawthorn, hazel and beech. The ground flora has abundant wood melick, soft grass and bluebell with pignut, wood anemone, wood speedwell, bramble and greater stitchwort.
Habitats:	Broad-leaved semi-natural woodland (1.617 ha)
Designation Reason:	Broad-leaved woodland and scrub



Appendix 6322/2:

Evaluation Methodology

Evaluation Methodology

1. The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[1].

Importance of Ecological Features

2. Ecological features within the site/study area have been evaluated in terms of whether they qualify as 'important ecological features'. In this regard, CIEEM guidance states that *"it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable".*

3. Various characteristics contribute to the importance of ecological features, including:

- Naturalness;
- Animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- Ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity;
- Habitat connectivity and/or synergistic associations;
- Habitats and species in decline;
- Rich assemblages of plants and animals;
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

4. As an objective starting point for identifying important ecological features, European, national and local governments have identified sites, habitats and species which form a key focus for biodiversity conservation in the UK, supported by policy and legislation. These are summarised by CIEEM guidance as follows:

Designated Sites

- Statutory sites designated or classified under international conventions or European legislation, for example World Heritage Sites, Biosphere Reserves, Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA);

[1] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*', Chartered Institute of Ecology and Environmental Management, Winchester

- Statutory sites designated under national legislation, for example Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
- Locally designated wildlife sites, e.g. Local Wildlife Sites (LWS).

Biodiversity Lists

- Habitats and species of principal importance for the conservation of biodiversity in England and Wales (largely drawn from UK BAP priority habitats and priority species), often referred to simply as Priority Habitats / Species;
- Local BAP priority species and habitats.

Red Listed, Rare, Legally Protected Species

- Species of conservation concern, Red Data Book (RDB) species;
- Birds of Conservation Concern;
- Nationally rare and nationally scarce species;
- Legally protected species.

5. In addition to this list, other features may be considered to be of importance on the basis of local rarity, where they enable effective conservation of other important features, or play a key functional role in the landscape.

<u>Assigning Level of Importance</u>

6. The importance of an ecological feature should then be considered within a defined geographical context. Based on CIEEM guidance, the following frame of reference is used:

- International (European);
- National;
- Regional;
- County;
- District;
- Local (e.g. Parish or Neighbourhood);
- Site (not of importance beyond the immediate context of the site).

7. Features of 'local' importance are those considered to be below a district level of importance, but are considered to appreciably enrich the nature conservation resource or are of elevated importance beyond the context of the site.

8. Where features are identified as 'important' based on the list of key sites, habitats and species set out above, but are very limited in extent or quality (in terms of habitat resource or species population) and do not appreciably contribute to the biodiversity interest beyond the context of the site, they are considered to be of 'site' importance.

9. In terms of assigning the level of importance, the following considerations are relevant:

Designated Sites

10. For designated sites, importance should reflect the geographical context of the designation (e.g. SAC/SPA/Ramsar sites are designated at the international level whereas SSSIs are designated at the national level). Consideration should be given to multiple designations as appropriate (where an area is subject to differing levels of nature conservation designations).

Habitats

11. In certain cases, the value of a habitat can be measured against known selection criteria, e.g. SAC selection criteria, 'Guidelines for the selection of biological SSSIs' and the Hedgerows Regulations 1997. However, for the majority of commonly encountered sites, the most relevant habitat evaluation will be at a more localised level and based on relevant factors such as antiquity, size, species-diversity, potential, naturalness, rarity, fragility and typicalness (Ratcliffe, 1977). The ability to restore or re-create the habitat is also an important consideration, for example in the case of ancient woodland.

12. Whether habitats are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Habitats of Principal Importance' or 'Priority Habitats', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular habitat under a BAP does not in itself imply any specific level of importance.

13. Habitat inventories (such as habitat mapping on the MAGIC database) or information relating to the status of particular habitats within a district, county or region can also assist in determining the appropriate scale at which a habitat is of importance.

Species

14. Deciding the importance of species populations should make use of existing criteria where available. For example, there are established criteria for defining nationally and internationally important populations of waterfowl. The scale within which importance is determined could also relate to a particular population, e.g. the breeding population of common toads within a suite of ponds or an otter population within a catchment.

15. When determining the importance of a species population, contextual information about distribution and abundance is fundamental, including trends based on historical records. For example, a species could be considered particularly important if it is rare and its population is in decline. With respect to rarity, this can apply across the geographic frame of reference and particular regard is given to populations where the UK holds a large or significant proportion of the international population of a species.

16. Whether species are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Species of Principal Importance' or 'Priority Species', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular species under a BAP does not in itself imply any specific level of importance.

17. Species populations should also be considered in terms of the potential zone of influence of the proposals, i.e. if the entire species population within the site and surrounding area were to be affected by the proposed development, would this be of significance at a local, district, county or wider scale? This should also consider the foraging and territory ranges of individual species (e.g. bats roosting some distance from site may forage within site whereas other species such as invertebrates may be more sedentary).

Appendix 6322/3:

Legislation Summary

LEGISLATION SUMMARY

1. In England and Wales primary legislation is made by the UK Parliament, and in Scotland by the Scottish Parliament, in the form of Acts. The main piece of legislation relating to nature conservation in the UK is the Wildlife and Countryside Act 1981 (as amended).

2. Acts of Parliament confer powers on Ministers to make more detailed orders, rules or regulations by means of secondary legislation in the form of statutory instruments. Statutory instruments are used to provide the necessary detail that would be too complex to include in an Act itself[1]. The provisions of an Act of Parliament can also be enforced, amended or updated by secondary legislation.

3. In summary, the key pieces of legislation relating to nature conservation in the UK are:

    - Wildlife and Countryside Act 1981 (as amended)
    - Protection of Badgers Act 1992
    - Hedgerows Regulations 1997
    - Countryside and Rights of Way (CRoW) Act for England and Wales 2000
    - Natural Environment and Rural Communities Act 2006
    - Conservation of Habitats and Species Regulations 2017

4. A brief summary of the relevant legislation is provided below. The original Acts and instruments should be referred to for the full and most up to date text of the legislation.

5. **Wildlife and Countryside Act 1981 (as amended)**. The WCA Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) identified for their flora, fauna, geological or physiographical features. The Act contains strict measures for the protection and management of SSSIs.

6. The Act also refers to the treatment of UK wildlife including protected species listed under Schedules 1 (birds), 5 (mammals, herpetofauna, fish, invertebrates) and 8 (plants).

7. Under Section 1(1) of the Act, all wild birds are protected such that is an offence to intentionally:

    - Kill, injure or take any wild bird;
    - Take, damage or destroy the nest of any wild bird whilst in use* or being built;
    - Take or destroy an egg of any wild bird.

    * The nests of birds that re-use their nests as listed under Schedule ZA1, e.g. Golden Eagle, are protected against taking, damage or destruction irrespective of whether they are in use or not.

8. Offences in respect of Schedule 1 birds are subject to special, i.e. higher, penalties. Schedule 1 birds also receive greater protection such that it is an offence to intentionally or recklessly:

    - Disturb any wild bird included in Schedule 1 while it is building a nest or while it is in, on or near a nest containing eggs or young;
    - Disturb dependent young of such a bird.

[1] http://www.parliament.uk/business/bills-and-legislation/secondary-legislation/statutory-instruments/

9. Under Section 9(1) of the Act, it is an offence to:

- Intentionally kill, injure or take any wild animal included in Schedule 5.

10. In addition, under Section 9(4) it is an offence to intentionally or recklessly:

- Obstruct access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection; or
- Disturb any wild animal included in Schedule 5 while occupying a structure or place which it uses for that purpose.

11. Under Section 13(1) it is an offence:

- To intentionally pick, uproot or destroy any wild plant listed in Schedule 8; or
- Unless the authorised person, to intentionally uproot any wild plant not included in Schedule 8.

12. The Act also contains measures (S.14) for preventing the establishment of non-native species that may be detrimental to native wildlife, prohibiting the introduction into the wild of animals (releases or allows to escape) and plants (plants or causes to grow) listed under Schedule 9.

13. **Protection of Badgers Act 1992.** The Act aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. It should be noted that the legislation is not intended to prevent properly authorised development. Under the Act it is an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat* a Badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett# (this includes disturbing Badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

* the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence

\# A sett is defined as "*any structure or place which displays signs indicating current use by a Badger*". Natural England advice (June 2009) is that a sett is protected so long as such signs remain present, which in practice could potentially be for some time after the last actual occupation by Badger. Interference with a sett includes blocking tunnels or damaging the sett in any way

14. Licences can be obtained from the Statutory Nature Conservation Organisation (SNCO) for development activities that would otherwise be unlawful under the legislation, provided there is suitable justification. The SNCO for England is Natural England.

15. **Hedgerows Regulations 1997**. 'Important' hedgerows (as defined by the Regulations) are protected from removal (up-rooting or otherwise destroying). Various criteria specified in the Regulations are employed to identify 'important' hedgerows for wildlife, landscape or historical reasons.

16. **Countryside and Rights of Way (CRoW) Act for England and Wales 2000.** The CRoW Act provides increased measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation. Schedule 12 of the Act amends the species provisions of the WCA 1981, strengthening the legal protection for threatened species. The Act also introduced a duty on Government to have regard to the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

17. **Natural Environment and Rural Communities Act 2006.** Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as local planning authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when exercising their normal functions. 56 habitats and 943 species of principal importance are included on the S41 list. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan (BAP).

18. **Conservation of Habitats and Species Regulations 2017 (as amended).** The Regulations enact the European Union's Habitats Directive (92/43/EEC) in the UK. The Habitats Directive was designed to contribute to the maintenance of biodiversity within member states through the conservation of sites, known in the UK as Special Areas of Conservation (SACs), containing habitats and species selected as being of EC importance (as listed in Annexes I and II of the Habitats Directive respectively). Member states are required to take measures to maintain or restore these natural and semi-natural habitats and wild species at a favourable conservation status.

19. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs)[2] classified under Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). These sites constitute the Natura 2000 network. The Regulations impose restrictions on planning decisions likely to significantly affect SPAs or SACs.

20. The Regulations also provide protection to European Protected Species of animals that largely overlaps with the WCA 1981, albeit the provisions are generally stricter. Under Regulation 43 it is an offence, *inter alia*, to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species;
- Deliberately disturb any wild animals of any such species, including in particular any disturbance likely to impair their ability to survive, to breed or reproduce, to rear or nurture their young, to hibernate or migrate, or which is likely to affect significantly their local distribution or abundance;
- Deliberately take or destroy the eggs of such an animal;
- Damage or destroy a breeding site or resting place of such an animal.

21. Similar protection is afforded to European Protected Species of plants, as detailed under Regulation 47.

22. The Regulations do provide a licensing system that permits otherwise illegal activities in relation to European Protected Species, subject to certain tests being fulfilled.

[2] Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC) (aka the Birds Directive), which came into force in April 1979. SPAs are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.

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Connah's Quay Power Station:
Southern Land Parcel

Phase 1 Habitat and Faunal Survey

July 2023

Quality Management	
Client:	Uniper UK Ltd
Project:	Connah's Quay Power Station: Southern Land Parcel
Report Title:	Phase 1 Habitat and Faunal Survey
Project Number:	ECO-6322
File Reference:	6322 EcoAp P1 South 2023 dv3 /ADB
Date:	10/07/2023

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This report may contain sensitive information relating to protected species. All records of Badger setts must remain confidential. Where this report is circulated publicly or uploaded to online planning portals, reference to Badger setts must be redacted and any maps pertaining to the locations of Badger setts removed from the document.

Legal Guidance

The information set out within this report in no way constitutes a legal opinion on the relevant legislation (refer to the relevant Appendix for the main provisions of the legislation). The opinion of a legal professional should be sought if further advice is required.

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Executive Summary

i) **Introduction.** Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake baseline ecological surveys of the Southern Land Parcel at Connah's Quay Power Station, Connah's Quay, Flintshire.

ii) **Survey.** The site was surveyed in August 2021 and April 2023 based on standard extended Phase 1 methodology. In addition, a general appraisal of faunal species was undertaken to record the potential presence of any protected, rare or notable species, with specific surveys conducted in respect of bats, Badger and Otter.

iii) **Ecological Designations.** No part of the site is designated for its ecological importance. The nearest statutory designation to the site is the Dee Estuary (SPA, Ramsar and SAC). This is a vast site which extends substantially beyond the site's north-western boundary. The nearest non-statutory designation is Top-y-fron Dingle and Kelserton Brook (LWS) located approximately 380m south of the site, separated from it by industrial development, roads and the railway. Ecological designations in the surrounding area are physically separated from the site and are unlikely to be adversely affected by works at the site.

iv) **Habitats.** The site comprises areas of cleared ground, scrub, tall ruderal vegetation, and hardstanding.

v) **Protected Species.** The site generally offers few opportunities for protected species [redacted]
Although no trees or buildings are present that might be used by bats as roosting sites it is likely that bats forage and commute along linear habitats around the site perimeter. Otter are highly likely to make use of habitat outside the site boundary associated with the Dee Estuary, but are unlikely to make use of the site itself.

1 Introduction

1.1 Background and Proposals

1.1.1 Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake baseline ecological surveys of the Southern Land Parcel at Connah's Quay Power Station, Connah's Quay, approximately centred at grid reference SJ 288 703 (see Plan 6322/ECO1), hereafter referred to as 'the site'.

1.2 Site Overview

1.2.1 The site is located in north-east Flintshire in North Wales (see Plan 6322/ECO1). The site is bounded to the north and east by the River Dee. Connah's Quay Power Station is located immediately adjacent to the site's western boundary and a railway line defines the site's southern site boundary. The town of Connah's Quay extends to the south. The Deeside Industrial Park is present to the north and east across the River Dee.

1.2.2 The site itself comprises hard standing and disturbed land which has been recently cleared of scrub, grassland, and small patches of scrub and tall ruderal vegetation.

1.3 Purpose of the Report

1.3.1 This report documents the methods and findings of the desk study and baseline ecology surveys undertaken. The importance of the habitats and species present is evaluated.

2 Methodology

2.1 Data Search

2.1.1 Background information relevant to the site and its immediate surroundings to a distance of 2km was sourced from the North Wales Environmental Information Service (Cofnod) in August 2021. The data obtained comprised information on designated sites and species records.

2.1.2 Information on statutory designations was obtained from the MAGIC database[1], which uses data provided by Natural England, from within an extended search area of 25km. The MAGIC database was also searched for the presence of Priority Habitats within or adjacent to the site. Relevant information is reproduced in Appendix 6322/1 and on Plan 6322/ECO2.

2.1.3 In addition, the Woodland Trust database[2] was searched for records of ancient, veteran or notable trees within or in proximity to the site.

2.2 Habitat Survey

2.2.1 The site was surveyed in August 2021 and April 2023 to assess the general ecological value of the land and to identify the main habitats and ecological features present. Vegetation clearance has taken place at the site since 2021. The habitats described in this report are those present during the most recent survey. Habitats present are shown on Plan 6322/ECO3.

2.2.2 The site was surveyed based on standard Phase 1 Habitat Survey methodology[3], whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail through Phase 2 surveys. This method was extended, in line with the Guidelines for Preliminary Ecological Appraisal[4] to record details on the actual or potential presence of any notable or protected species or habitats.

2.2.3 The nomenclature used for plant species within this report is based on that of the Botanical Society for the British Isles (BSBI) Checklist and Stace (2019) [5].

2.3 Faunal Surveys

2.3.1 General faunal activity, such as mammals or birds observed visually or by call during the course of the surveys was recorded during all surveys. Attention was paid to the potential presence of protected, rare or notable species as described below.

[1] Multi-Agency Geographic Information for the Countryside (MAGIC), https://magic.defra.gov.uk/

[2] Woodland Trust Ancient Tree Inventory, https://ati.woodlandtrust.org.uk/, consulted March 2022.

[3] Joint Nature Conservation Committee (2010, as amended) 'Handbook for Phase 1 habitat survey: A technique for environmental audit.'

[4] Chartered Institute for Ecology and Environmental Management (CIEEM) (2013) 'Guidelines for Preliminary Ecological Appraisal.'

[5] Stace, C (2019) *'New Flora of the British Isles (4th Edition)'* C & M Floristics

Bats[6]

Visual Inspection Surveys

2.3.2 **Trees**. Trees were assessed for their suitability to support roosting bats based on the presence of potential roosting features such as holes, cracks, splits or loose bark. Suitability for roosting bats was rated based on relevant guidance[7] as:

- Negligible;
- Low;
- Moderate; or
- High.

2.3.3 Where possible. potential roost features identified were inspected for signs indicating possible use by bats, including staining, scratch marks or bat droppings.

Badger (*Meles meles*)

2.3.4 A Badger survey was carried out in August 2021 and again in April 2023. The survey, undertaken in accordance with standard methods[8], comprised two main elements. The first element involved searching for evidence of Badger setts. For any setts that were encountered, each sett entrance was noted and mapped. The survey set out to record the following information, where present:

- Number and location of well used / active entrances; these are clear from any debris or vegetation and are obviously in regular use and may, or may not, have been excavated recently;
- Number and location of inactive entrances; these are not in regular use and have debris such as leaves and twigs in the entrance or have plants growing in or around the edge of the entrance; and
- Number of disused entrances; these have not been in use for some time, are partly or completely blocked and cannot be used without considerable clearance. If the entrance has been disused for some time all that may be visible is a depression in the ground where the hole used to be and the remains of the spoil heap.

2.3.5 The second element involved searching for signs of Badger activity such as well-worn paths and push-throughs, snagged hair, footprints, latrines and foraging signs, so as to build up a picture of any use of the site by Badger.

Otter (*Lutra lutra)*

2.3.6 The boundary of the site beside the Dee Estuary and all parts of the site itself were searched for signs of Otter[9] in August 2021 and again in April 2023. Such signs include holts (underground chambers used for lying up), spraints, prints, paths and slides. The southern bank of the estuary was examined where possible, using binoculars where appropriate.

[6] English Nature (2004) *'Bat Mitigation Guidelines'*

[7] Collins, J. (ed.) (2016) '*Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn).' Bat Conservation Trust

[8] Mammal Society (1989) '*Occasional Publication No. 9 – Surveying Badgers*'

[9] Life in UK Rivers (2003) *'Monitoring the Otter - Conserving Natura 2000 Rivers*'. Monitoring Series No. 10

Water Vole (*Arvicola amphibius)*

2.3.7 The boundary of the site beside the Dee Estuary and all parts of the site itself were searched for signs of Water Vole[10] in August 2021 and again in April 2023. Such signs include latrines, tunnels, lawns (small areas of vegetation grazed by Water Vole) and footprints. The southern bank of the estuary was examined where possible, using binoculars where appropriate.

2.4 Survey Constraints and Limitations

2.4.1 All of the species that occur in each habitat are not necessarily detectable during survey work carried out at any given time of the year, since different species are apparent during different seasons. The Phase 1 habitat surveys were undertaken within the optimal season and during different months, thereby allowing a robust and thorough assessment of habitats and botanical interest across the site.

2.4.2 All parts of the site were accessed at the time of both surveys.

2.4.3 The presence of invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was noted. However, the detectability of such species varies according to time of year, management regime and other factors and this report should not be taken as definitive regarding the presence or absence of such species at the site.

2.4.4 Densely vegetated habitats and areas that have limited access such as steep river banks may reduce the detectability of field signs of species such as Badger, Otter and Water Vole. Whilst some areas of dense vegetation are present within the site, these were searched as thoroughly as practicable and hence it is considered that the survey results provide a sufficiently accurate baseline to assess the potential impacts of the proposals on all species assessed.

2.5 Ecological Evaluation Methodology

2.5.1 The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018)[11], which involves identifying 'important ecological features' within a defined geographical context (i.e. international, national, regional, county, district, local or site importance). Further detail is provided in Appendix 6322/2.

2.6 National Policy Approach to Biodiversity in the Planning System

2.6.1 National Planning Policy in Wales is set out in Planning Policy Wales (PPW)[12]. This describes policies designed to maximise environmental protection and limit environmental impact including the promotion of resilient biodiversity and ecosystems, citing biodiversity as an element in the delivery of distinctive and natural places, and ensuring environmental sustainability through good design.

[10] Surveys based on: Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) '*Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.*

[11] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'*, ver. 1.1, Chartered Institute of Ecology and Environmental Management, Winchester

[12] Llywodraeth Cymru/Welsh Government (2021). *'Planning Policy Wales'*, Edition 11, February 2021.

2.6.2 PPW sets out a framework for the sustainable management of natural resources, which within which the planning system contribute by:

'• improving the resilience of ecosystems and ecological networks;

• halting and reversing the loss of biodiversity;

• maintaining and enhancing green infrastructure based on seeking multiple ecosystem benefits and solutions;' amongst other measures.

2.6.3 PPW embeds the protection and enhancement of biodiversity within all components of the planning system in Wales, stating that:

'Biodiversity loss should be reversed, pollution reduced, environmental risks addressed and overall resilience of ecosystems improved.'

2.6.4 The approach to dealing with biodiversity in the context of planning applications is set out on Section 6.4, stating:

'The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.'

and

'Development plan strategies, policies and development proposals must consider the need to:

• support the conservation of biodiversity, in particular the conservation of wildlife and habitats;

• ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;

• ensure statutorily and non-statutorily designated sites are properly protected and managed;

• safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and

• secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.'

'All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission.'

2.6.5 PPW does not currently mandate a target for Biodiversity Net Gain, but does set out that:

'…development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity;'

'…planning decisions should incorporate measures which seek the creation, restoration and appropriate management of green networks and linkages between habitats and maintaining and enhancing other green infrastructure features and networks'.

2.6.6 The above approach encapsulates the 'mitigation hierarchy' described in British Standard BS 42020:2019[13], which involves the following step-wise process:

- **Avoidance –** avoiding adverse effects through good design;
- **Mitigation –** where it is unavoidable, mitigation measures should be employed to minimise adverse effects;
- **Compensation –** where residual effects remain after mitigation it may be necessary to provide compensation to offset any harm; and
- **Enhancement –** planning decisions often present the opportunity to deliver benefits for biodiversity, which can also be explored alongside the above measures to resolve potential adverse effects.

2.6.7 The measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development (BS 42020:2019, section 5.5).

2.7 Local Policy

2.7.1 The Local Policy for Cyngor Sir y Fflint Flintshire County Council is currently set out within the 'Flintshire Local Development Plan 2015 - 2030 (Adopted January 2023)'. Policies that relate specifically to ecology and biodiversity are set out below.

2.7.2 Policy EN2: Green Infrastructure

"Development proposals will be required to protect, maintain and enhance the extent, quality and connectivity of the green infrastructure network, including designated and non-designated green spaces (as shown on the proposals maps and listed in the table below), and where appropriate:

a. Create new green infrastructure linkages from the proposed development to the existing local network;

b. Fill in gaps in the existing network to improve connectivity.

Where the loss or damage of existing green infrastructure is unavoidable, appropriate mitigation and compensation will be required."

2.7.3 Policy EN3: Undeveloped Coast and Dee Estuary Corridor states:

"Within the undeveloped coast development will only be permitted where:

a. It can be demonstrated a coastal location is essential;

[13] British Standards Institution (2013) '*Biodiversity – Code of practice for planning and development*', BS 42020:2019

b. *It conserves and enhances the open character of the coast;*

c. *It would not unacceptably harm areas of nature conservation, landscape or biodiversity;*

d. *It would not harm existing or proposed recreational or active travel routes;*

e. *Extensive coastal protection measures are not required; and*

f. *It would not be potentially at risk of flooding nor unacceptably increase erosion or flooding or interfere with natural coastal processes."*

2.7.4 Policy EN6: Sites of Biodiversity and Geodiversity Importance states:

"Development will not be permitted that would result in an adverse effect on the integrity of sites of international nature conservation importance. Proposals where adverse effects on site integrity cannot be ruled out would not be supported.

Development likely to impact the special features of a Nationally Designated Site will only be granted in exceptional circumstances where appropriate compensation can be provided. Development proposals that would have a significant adverse effect on locally designated sites or site with other biodiversity and / or geological interest, including priority species, will only be permitted where:

a. *it can be demonstrated that the need for the development outweighs the biodiversity or geological importance of the site; and*

b. *it can be demonstrated that the development cannot reasonably be located elsewhere; and*

c. *any unavoidable harm is minimised by effective mitigation to ensure that there is no reduction in the overall biodiversity value of the area. Where this is not feasible compensation measures designed to create, restore and enhance biodiversity must be provided.*

Development that results in the restoration, enhancement and creation of habitats will be supported especially where this promotes the resilience of ecosystems."

2.7.5 Policy EN7: Development Affecting Trees, Woodlands and Hedgerows states:

"Development proposals that will result in significant loss of, or harm to, trees, woodlands or hedgerows of biodiversity, historic, and amenity value will not be permitted.

Where the impact of development affecting trees, woodlands or hedgerows is considered acceptable, development will only be permitted where:

a. *the development maximises their retention through sensitive design*

b. *measures; and*

c. *where the removal of trees is considered necessary, suitable replacements*

d. *shall be provided elsewhere within the site; and*

e. *it results in a net benefit in biodiversity."*

2.7.6 Policy EN7: Development In or Adjacent to Conservation Areas states:

"Development within or adjacent to a conservation area will only be permitted if it would preserve or enhance the character and appearance of the conservation area or its setting. New development in such locations must also be of a high standard of design, respond to the area's special characteristics, and pay particular regard to:

a. important views, vistas, street scenes, roofscapes, trees, open spaces, gaps and other features that contribute to the character or appearance of the conservation area;

b. the retention of historically significant boundaries or other elements that contribute to the established form of development;

c. the relationship to existing buildings and spaces, and pattern of development;

d. scale, height and massing, architectural design and detailing, the use of materials, boundary treatment, and public realm materials."

3 Ecological Designations

3.1 Statutory Designations

Description

3.1.1 The statutory designations of ecological importance that occur within the local area are shown on Plan 6322/ECO2.

3.1.2 The Dee Estuary Special Protection Area (SPA), Ramsar site, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), all of which designations cover the same area, lie immediately adjacent to the site beyond its north-eastern boundary. The Dee Estuary is designated as a SPA and Ramsar site on the basis of its breeding and winter waterbird populations and assemblages. It is designated as a SAC on the basis of its mudflats and sandflats, annual colonising mud and sand and Atlantic salt meadow habitats (see Appendix 6322/1 for citation sheets).

3.1.3 The next closest statutory designation to the site is the River Dee and Bala Lake Special Area of Conservation (SAC) is located approximately 1.4km east of the site at its closest point. This is an extensive site covering over 1200ha extending through North Wales along the River Dee to Bala Lake. The SAC is designated for Atlantic Salmon *Salmo salar*, Floating Water-plantain *Luronium natans*, and for comprising a watercourse of plain to montane level with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation characterised by an abundance of Water-crowfoot *Ranunculus* spp.

3.1.4 Other statutory designations in the wider area include Deeside and Buckley Newt Sites SAC, the closest component part of which is Connah's Quay Ponds and Woodland SSSI approximately 2.0km south of the site, Mynydd y Fflint/Flint Mountain SSSI approximately 3.0km to the west and Halkyn Mountain SAC over 5km to the west.

Evaluation

3.1.5 No statutory designation is likely to be at risk of adverse effects as a result of works at the site.

3.2 Non-statutory Designations

Description

3.2.1 The non-statutory designations of nature conservation interest that occur within the local area are shown on Plan 6322/ECO2. The nearest non-statutory designation is Top-y-fron Dingle and Kelserton Brook LWS approximately 380m south-west of the site, separated from it by industrial development, roads and the railway. This LWS is designated because it is an area of semi-natural broad-leaved woodland occupying a deeply wooded valley in which the Kelsterton Brook flows (see Appendix 6322/1 for citation).

3.2.2 The next nearest non-statutory designation is Cheshire Farm Wood (LWS), a small area of semi-natural broadleaved woodland following the course of a small stream 950m south-west of the site. Leadbrook Wood Local Wildlife Site (LWS), another wooded valley site, is located approximately 1.6km west of the site.

3.2.3 All non-statutory designations are separated from the site by intervening development and road and rail infrastructure and are not likely to be at risk of adverse effects resulting from works undertaken at the site.

Evaluation

3.2.4 The site itself is not subject to any non-statutory nature conservation designations. All non-statutory designations in the surrounding area are sufficiently distant from the site and separated by other land uses that they are unlikely to be affected by activities at the site.

3.3 Priority Habitats, Ancient Woodland and Notable Trees

Description

3.3.1 No Priority habitats are located within the site, however, the Priority Habitat Saltmarsh is present outside the site immediately adjacent to the northern and western site boundaries, within the River Dee Estuary.

3.3.2 There are no areas of ancient woodland within the site or its wider area.

3.3.3 There are no records of any notable or veteran trees within or adjacent to the site.

4 Habitats and Ecological Features

4.1 Background Records

4.1.1 Data supplied by Cofnod from the last 10 years within 2km of the site included records of the Flintshire Rare plant species (occurring in no more than three 2km tetrads within the vice-county) Rock Samphire *Crithmum maritimum*, Caper Spurge *Euphorbia lathyris*, Narrow-leaved Pepperwort *Lepidium ruderale*, Sweet Briar *Rosa rubiginosa*, Annual Pearlwort *Sagina apetala* subsp. *apetala*, Long-spiked Glasswort *Salicornia dolichostachya*, Wild Clary *Salvia verbenaca*, Knotted Hedge-parsley *Torilis nodosa* and Navelwort *Umbilicus rupestris.*

4.1.2 Records were also returned of the Flintshire Scarce species (occurring in 4-8 2km tetrads) Red Goosefoot *Chenopodium rubrum*, Perennial Wall-rocket *Diplotaxis tenuifolia*, Wood Spurge *Euphorbia amygdaloides*, Small-flowered Crane's-bill *Geranium pusillum*, Stinking Iris *Iris foetidissima*, Prickly Lettuce *Lactuca serriola*, Narrow-leaved Meadow-grass *Poa angustifolia* and Reflexed Saltmarsh-grass *Puccinellia distans.*

4.1.3 Records were also returned of numerous invasive species including Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera,* Cherry Laurel *Prunus laurocerasus* and *Cotoneaster* sp.

4.1.4 No evidence of the presence of any of these species within the site was recorded during any of the surveys undertaken.

4.2 Overview

4.2.1 The habitats and ecological features present within the site are described below and evaluated in terms of whether they constitute an important ecological feature and their level of importance, taking into account the status of habitat types and the presence of rare plant communities or individual plant species of elevated interest. The likely effects of potential works on these habitats and ecological features are then assessed. The value of habitats for the fauna they may support is considered separately in Chapter 5 below.

4.2.2 The following habitats and ecological features were identified within the site:

- Rough Grassland;
- Scrub;
- Tall Ruderal Vegetation; and
- Cleared Ground and Hardstanding.

4.2.3 These habitats and features are shown on Plan 6322/ECO3 and described below.

4.3 Priority Habitats

4.3.1 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. In particular, Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats which are of principal importance for conservation in England. This list is largely derived from the 'Priority Habitats' listed under the former UK Biodiversity Action Plan (BAP), which continue to be regarded as priority habitats under the subsequent country-level biodiversity strategies.

4.3.2 Of the habitats within the site, none are likely to qualify as Priority Habitat.

4.4 Rough Grassland

Description

4.4.1 The eastern section of the site largely comprises open rough grassland, dominated by common and widespread species including Perennial Rye-grass *Lolium perenne*, Creeping Bent *Agrostis stolonifera*, Red Fescue *Festuca rubra,* Yorkshire-fog *Holcus lanatus* and Cock's-foot *Dactylis glomerata*. Herbs include Creeping Thistle *Cirsium arvense*, Ragwort *Senecio jacobaea*, Nettle *Urtica dioica,* Dock *Rumex* sp., Hogweed *Heracleum sphondylium* and Burdock *Arctium minus*. Areas of bare ground are present in patches where scrub had been cleared.

Evaluation

4.4.2 Overall, the grassland supports a low diversity of common and widespread species, and is considered to be of low ecological value. This grassland does not form an important ecological feature.

4.5 Scrub

Description and Evaluation

4.5.1 Areas of dense and scattered scrub are present around the boundaries of the site as shown on Plan 6322/ECO3.

4.5.2 Dense scrub is present beside the southern site boundary in a thin strip, becoming denser to the west. Scattered scrub is present in isolated locations distributed around the site. Previously, scrub was present in greater density but has been recently cleared across the majority of the site.

4.5.3 Scrub comprises common and widespread species of limited botanical interest including Silver Birch *Betula pendula,* Butterfly-bush *Buddleia davidii*, Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*, Bramble *Rubus fruticosus* agg. and Elder *Sambucus nigra*.

4.5.4 The areas of scrub within the site comprise common and widespread species of low botanical interest. These habitats are not important ecological features and their loss would be of minor significance.

4.6 Tall Ruderal Vegetation

Description and Evaluation

4.6.1 Several small areas of tall ruderal vegetation were recorded in association with areas of scrub (see Plan 6322/ECO3).

4.6.2 Tall ruderal vegetation was dominated by Common Nettle, Hogweed, Mugwort *Artemisia vulgaris*, and Redshank *Persicaria maculosa*. These are common and widespread species of limited botanical interest which readily colonise field margins and disturbed ground. Tall ruderal vegetation does not constitute an important ecological feature and its loss would be of negligible ecological significance.

4.7 Cleared Ground and Hard Standing

Description and Evaluation

4.7.1 Tracks within the site, and areas of exposed clinker/gravel substrate are abundant throughout the site, particularly since scrub clearance has been undertaken. These areas are largely devoid of vegetation except for patches of naturally colonising species, notably ruderals, and are of negligible ecological value.

4.8 Habitat Evaluation Summary

4.8.1 On the basis of the above, none of the habitats within the site are considered to form important ecological features.

5 Faunal Use of the Site

5.1 Overview

5.1.1 During the survey work, general observations were made of faunal use of the site with particular attention paid to the potential presence of protected or notable species. Specific surveys and assessments were undertaken in respect of Badgers, bats, Otter and Water Vole as described below.

5.1.2 Surveys for birds and reptiles have also been undertaken at the site and these are documented in separate reports.

5.2 Priority Species

5.2.1 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. In particular, Section 41 of the NERC Act requires the Secretary of State to publish a list of species which are of principal importance for conservation in England. This list is largely derived from the 'Priority Species' listed under the former UK Biodiversity Action Plan (BAP), which continue to be regarded as priority species under the subsequent country-level biodiversity strategies.

5.2.2 During the survey work undertaken, no Priority Species were recorded within the site. This is discussed further below.

5.3 Bats

5.3.1 **Legislation.** All British bats are listed as European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended) and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). As such, bats and their roosts (breeding sites and resting places) receive full protection under the legislation (see Appendix 6322/3 for detailed provisions). If works are likely to result in an offence a licence may need to be obtained from Natural England which would be subject to appropriate measures to safeguard bats. Given all bats are protected species, they are considered to represent important ecological features. A number of bat species are also S41 Priority Species.

5.3.2 **Background Records.** No records of bats from within or adjacent to the site were returned from the desk study. Data from within 2km of the site included records of Pipistrelle *Pipistrellus* sp., Daubenton's Bat *Myotis daubentonii*, and Whiskered Bat *Myotis mystacinus.*

5.3.3 **Survey Results and Evaluation**

Roosting

Trees

5.3.4 All trees within the site were assessed for their suitability to support roosting bats. The only trees with potential to support roosting bats were those within tree line **TL1**, assessed as of low potential on the basis of the trees being of a size and age suitable to contain potential roosting features.

5.3.5 Bats are dynamic animals that can readily colonise new sites where potential exists. Natural England guidance in respect of European Protected Species[14] such as bats advises that, even where proposals are reasonably unlikely to result in any offence, such that licensing is not required, reasonable precautions should be taken to minimise the risk to protected species in the unlikely event that they should be found during the course of activities that may disturb roosts.

Foraging / Commuting

5.3.6 The habitats present on site include a mixture of rough grassland, scrub, hedgerows, ponds and a tree line that may potentially be used by foraging bats, although connectivity with suitable areas of habitat off-site is limited. It is possible that the adjacent railway corridor may offer some connectivity and foraging potential for bats, as might the River Dee corridor, although as it comprises a large open estuarine area any bat activity is likely to be limited. Lighting from the power station and the town of Connah's Quay is anticipated to further limit the suitability of the area to provide important features used by bats.

5.4 Badger

5.4.1 **Legislation.** Badger receive legislative protection under the Protection of Badgers Act 1992 (see Appendix 6322/3 for detailed provisions), and as such should be assessed as an important ecological feature. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status; Badger is common throughout most of Britain. It is the duty of planning authorities to consider the conservation and welfare impacts of development upon Badger and issue permissions accordingly.

5.4.2 Licences can be obtained from Natural England for development activities that would otherwise be unlawful under the legislation. Guidance on the types of activity that should be licensed is laid out in the relevant best practice guidance. [15, 16]

5.4.3 **Background Records.** Records for Badger were returned from within 2km of the site, although precise locations are unspecified.

5.4.4 [redacted]

5.4.5 [redacted]

5.5 Dormouse

5.5.1 **Legislation.** Dormouse is fully protected under the Wildlife and Countryside Act 1981 (as amended) and is a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended). Such legislation affords protection to individuals

[14] Natural England (2013) *'European Protected Species: Mitigation Licensing - How to get a licence (WML-G12)'*
[15] English Nature (2002) '*Badgers and Development*'
[16] Natural England (2011) '*Badgers and Development: A Guide to Best Practice and Licensing'*, Interim Guidance Document

of the species and their breeding sites and places of rest (see Appendix 6322/3 for detailed provisions). Dormouse is also a S41 Priority Species. On this basis, Dormouse is considered to form an important ecological feature.

5.5.2 **Background Records.** No records of Dormouse were returned from the local record centre from within 2km of the site.

5.5.3 **Survey Results and Evaluation.** The site is close to the limits of the known UK distribution of this species. Habitats present provide very limited opportunities for Dormouse, restricted to scrub but this habitat lacks the structure and preferred species such as Hazel *Corylus avellana* and Honeysuckle *Lonicera periclymenum*. The site also lacks connectivity with offsite habitats, being isolated by the River Dee to the north and east, and development to the west and south.

5.5.4 The lack of connectivity and limited suitability, combined with the lack of local records and the UK location of the site, indicates that Dormouse is likely to be absent from the site.

5.6 Otter and Water Vole

5.6.1 **Legislation.** Otter is fully protected under the Wildlife and Countryside Act 1981 (as amended) and is a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended). Such legislation affords protection to individuals of the species and their breeding sites and places of rest (see Appendix 6322/3 for detailed provisions). Otter is also a S41 Priority Species. On this basis, Otter is considered to represent an important ecological feature.

5.6.2 Water Vole is also fully protected under the Wildlife and Countryside Act 1981 (as amended). Water Vole is also a S41 Priority Species. As such, this species is considered to represent an important ecological feature. The legislation affords protection to individuals of the species and their breeding sites and places of shelter (see Appendix 6322/3 for detailed provisions).

5.6.3 If, despite all reasonable efforts, properly authorised development will adversely affect Water Vole and there are no alternative habitats nearby, Natural England may issue a licence to displace or trap and translocate Water Vole for the purpose of development. To issue such a licence, Natural England would need to be assured there is no reasonable alternative to the development and that there are no other practical solutions that would allow Water Vole to be retained at the same location. Natural England would also require no net loss of Water Vole habitat resulting from the works.

5.6.4 **Background Records.** Several records of Otter and Water Vole were returned from within 2km of the site. Two records of Water Vole originated from a site North of the River Dee and three records of Otter were associated with the River Dee itself.

5.6.5 **Survey Results and Evaluation.** The habitats within the site itself are generally unsuitable for Otter and Water Vole, however the offsite adjacent River Dee Estuary provides highly suitable foraging and commuting habitat for Otter with potential for resting sites, including along the sea wall adjacent to (outside) the northern boundary of the site.

5.6.6 The River Dee Estuary does not provide suitable habitat for Water Vole which favours smaller, more densely vegetated watercourses.

5.6.7 Targeted surveys for evidence of Otter and Water Vole were undertaken at the site in August 2021 and again in April 2023. No evidence of Otter or Water Vole was found during

any of the surveys undertaken and it is concluded that neither species currently makes use of habitats within the site. Nevertheless, it is highly likely that Otter make use of the corridor of the River Dee and its fringing habitats outside the site boundary, notably areas of saltmarsh in which dee channels have been cut within the mud. Otter may therefore be present within the site irregularly.

5.7 Other Mammals

5.7.1 **Legislation.** Other native UK mammals receive protection against acts of cruelty (e.g. under the Wild Mammals (Protection) Act 1996). Additionally, some are S41 Priority Species and should therefore be assessed as important ecological features.

5.7.2 **Background Records.** Records of Hedgehog *Erinaceus europaeus* (Priority Species), Stoat *Mustela erminea* and Brown Hare *Lepus europaeus* were returned from within 2km of the site.

5.7.3 **Survey Results and Evaluation.** No evidence of any other protected, rare or notable mammal species was recorded within the site. Other mammal species likely to make use of the site, such as Fox *Vulpes vulpes*, remain common in both a local and national context. As such, these species are not a material planning consideration and the loss of potential opportunities for these species would be of negligible significance.

5.7.4 The data search returned background records of Hedgehog within the surrounding area. Hedgehog is a Priority Species, albeit one that remains common and widespread in England. The site offers potential opportunities for this species, particularly in the form of areas of scrub, tall ruderal vegetation and grassland, and therefore it is likely that Hedgehog uses the site, and as such is assessed as of importance at the site level.

5.8 Amphibians

5.8.1 **Legislation.** All British amphibian species receive a degree of protection under the Wildlife and Countryside Act 1981 (as amended). Great Crested Newt is protected under the Act and is also classed as a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended). As such, both Great Crested Newt and habitats utilised by this species are afforded protection (see Appendix 6322/3 for detailed provisions). Great Crested Newt is also a S41 Priority Species, as are Common Toad *Bufo bufo*, Natterjack Toad *Epidalea calamita*, and Pool Frog *Pelophylax lessonae*. As such, these species should be assessed as important ecological features.

5.8.2 **Background Records.** No specific records of amphibians from within or adjacent to the site were returned by the data search. Three records of Smooth Newt *Lissotriton vulgaris* were returned from within 2km of the site.

5.8.3 **Survey Results and Evaluation.** No water bodies are present on site. Three ponds and a number of drainage ditches are present within 250m of the site boundary, although these are separated from site by the railway line, roads and developed land.

5.8.4 The Dee Estuary SAC/SPA/Ramsar site lists a breeding population of Natterjack Toad *Epidalea calamita* as a qualifying species. However, this is a reintroduced population that is restricted to the Gronant Dunes and Talacre Warren SSSI, located 19.5km north-west of the site. As such, given the distance from the known population and the lack of suitable Natterjack Toad habitat present within the site, Natterjack Toad is considered to be absent from the site.

5.9 Invertebrates

5.9.1 **Legislation.** Several invertebrate species are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). In addition, Large Blue Butterfly *Maculinea arion*, Fisher's Estuarine Moth *Gortyna borelii lunata* and Lesser Whirlpool Ramshorn Snail *Anisus vorticulus* receive protection under the Conservation of Habitats and Species Regulations 2017 (as amended); see Appendix 6322/3 for detailed provisions. A number of invertebrates are also S41 Priority Species. Where such species are present, they should be assessed as important ecological features.

5.9.2 **Background Records.** No records of invertebrates were returned from within or adjacent to the site. A number of records of Wall *Lasiommata megera*, Small Heath *Coenonympha pamphilus*, Autumnal Rustic *Eugnorisma glareosa*, Garden Dart *Euxoa nigricans*, White-line Dart *Euxoa tritici*, Oak Hook-tip *Watsonalla binaria*, White Ermine *Spilosoma lubricipeda*, Buff Ermine *Spilosoma lutea*, Blood-vein *Timandra comae* and Cinnabar *Tyria jacobaeae* (Priority Species) were returned from Cofnod from within 2km of the site.

5.9.3 **Survey Results and Evaluation.** No evidence of the presence of any protected, rare or notable invertebrate species was recorded within the site. The site contains relatively few micro-habitats that would typically indicate elevated potential for invertebrates[17], such as a variable topography with areas of vertical exposed soil, areas of species-rich semi-natural vegetation; variable vegetation structure with frequent patches of tussocks combined with short turf; free-draining light soils; walls with friable mortar or fibrous dung. Accordingly, given the habitat composition of the site and lack of adjacent sites designated for significant invertebrate interest, it is considered unlikely that significant protected, rare or notable invertebrate populations are present, and the site is unlikely to support an important invertebrate assemblage.

5.10 Summary

5.10.1 On the basis of the above, a summary of the evaluation of fauna is provided below:

Table 5.1. Evaluation summary of fauna forming important ecological features.

Species / Group	Supported by or associated with the site	Level of Importance
Bats – Roosting	Potential habitat in the form of trees	Local
[redacted]		
Otter	Likely commuting habitat offsite; potential for occasional presence within the site	Negligible
Hedgehog	Local records of presence; suitable habitat on site	Site

[17] Natural England (2010) 'Higher Level Stewardship – Farm Environment Plan (FEP) Manual', 3rd Edition

6 Conclusions

6.1.1 Aspect Ecology has carried out baseline ecological surveys at the Connah's Quay Power Station Southern Land Parcel, based on the results of a desk study and ecological surveys of the site.

6.1.2 No statutory or non-statutory nature conservation designations are present within the site although the Dee Estuary SPA/Ramsar/SAC is present in close proximity.

6.1.3 The surveys undertaken have shown that the site is dominated by habitats of low ecological importance, none of which are likely to qualify as Priority Habitat.

6.1.4 [redacted]

6.1.5 Studies undertaken at the site in respect of reptiles and birds are reported separately.

Plan 6322/ECO1:

Site Location

Key:

Site Location

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Connah's Quay (South)	PROJECT
Site Location	TITLE
6322/ECO1	DRAWING NO.
A/BG	REV
April 2023	DATE

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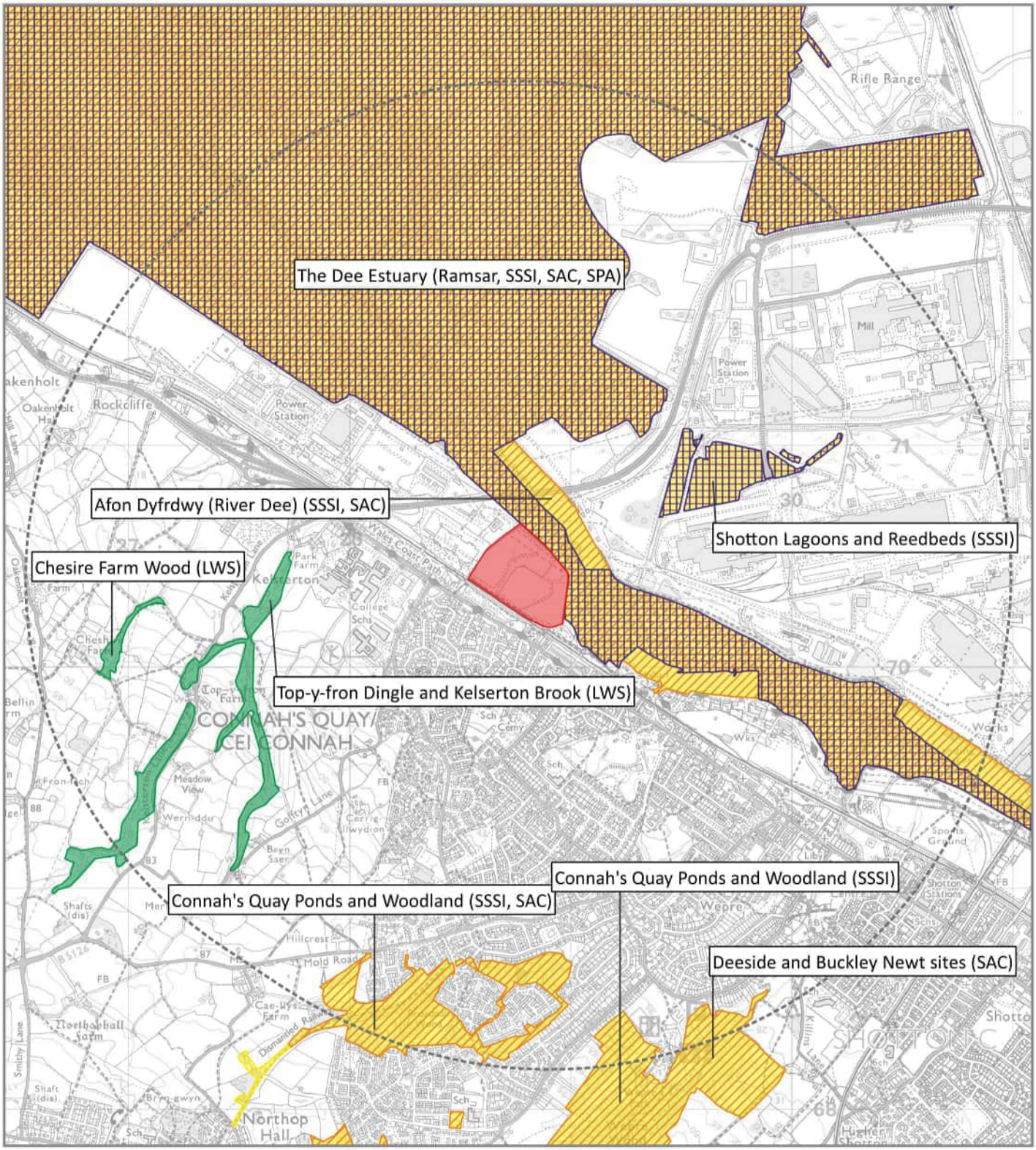
Plan 6322/ECO2:

Ecological Designations



Key:

- Site Location
- 2km Study Area
- Ramsar Site
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)

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Connah's Quay (South)	PROJECT
Ecological Designations	TITLE
6322/ECO2	DRAWING NO.
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Plan 6322/ECO3:

Habitats and Ecological Features

Key:

- Site Boundary
- Bare Ground/Recolonising
- Bracken
- Building
- Dense Scrub
- Hardstanding
- Rough Grassland
- Tall Ruderal
- Scattered Scrub
- Tree

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Connah's Quay (South)	PROJECT
Habitats and Ecological Features	TITLE
6322/ECO3	DRAWING NO.
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April 2023	DATE

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Appendix 6322/1:

Desk Study Data

EC Directive 79/409 on the Conservation of Wild Birds: Citation for Special Protection Area (SPA)

Name: The Dee Estuary

Unitary Authority/County: Cheshire West and Chester, Denbighshire, Flintshire, Wirral.

Boundary of the SPA: The Dee Estuary SPA encompasses the Dee Estuary/Aber Afon Dyfrdwy Site of Special Scientific Interest (SSSI); the dunes and intertidal foreshore at Gronant Dunes and Talacre Warren SSSI; the freshwater marsh at Inner Marsh Farm SSSI; and the lagoons and reedbeds at Shotton Lagoons and Reedbeds. The boundary of the SPA is shown on the map enclosed.

Site description: The Dee Estuary lies on the border between England and Wales on the north-west coast of Britain. It is a large, funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. Where agricultural reclamation has not occurred, the saltmarshes grade into transitional brackish and swamp vegetation on the upper shore. The site also includes the three sandstone islands of Hilbre, with their important cliff vegetation and maritime heathland and grassland. The two shorelines of the estuary show a marked contrast between the industrialised usage of the coastal belt in Wales and residential and recreational usage in England. The site is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders; in summer the site supports nationally important breeding colonies of two species of tern. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for Sandwich terns post-breeding.

Size of SPA: 14,291.56 ha.

European ornithological interest of SPA:

Qualifying species:
The site qualifies under **Article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex I species	Count and Season	Period	% of GB population
Bar-tailed Godwit *Limosa lapponica*	1,150 individuals - wintering	5 year peak mean 1994/95 - 1998/99	2.2%
Common Tern *Sterna hirundo*	392 pairs - breeding	5 year mean 1995 – 1999	3.2%
Little Tern *Sterna albifrons*	69 pairs – breeding	5 year mean 1995 - 1999	2.9%
Sandwich Tern *Sterna sandvicensis*	957 individuals- autumn passage	5 year mean 1995 - 1999	2.3%

The site qualifies under **Article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	**Count and Season**	**Period**	**% of population**
Redshank *Tringa totanus*	8,795 individuals - passage	5 year mean 1994/95 – 1998/99	5.9% Eastern Atlantic (wintering)
Shelduck *Tadorna tadorna*	7,725 individuals - wintering	5 year mean 1994/95 - 1998/99	2.6% Northwestern Europe
Teal *Anas crecca*	5,251 individuals - wintering	5 year mean 1994/95 - 1998/99	1.3% Northwestern Europe
Pintail *Anas acuta*	5,407 individuals - wintering	5 year mean 1994/95 - 1998/99	9.0% Northwestern Europe
Oystercatcher *Haematopus ostralegus*	22,677 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Europe & N/W Africa (wintering)
Grey Plover *Pluvialis squatarola*	1,643 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Eastern Atlantic (wintering)
Knot *Calidris canutus islandica*	12,394 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% NE Can/Grl/ Iceland/NW Eur
Dunlin *Calidris alpina*	27,769 individuals - wintering	5 year mean 1994/95 - 1998/99	2.0% N Siberia/Europe/ W Africa
Black-tailed Godwit *Limosa limosa islandica*	1,747 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Iceland (breeding)
Curlew *Numenius arquata*	3,899 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Europe (breeding)
Redshank *Tringa totanus*	5,293 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% Eastern Atlantic (wintering)

Assemblage qualification
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 120,726 individual waterbirds (5 year peak mean 1994/95 - 1998/99), including: Great Crested Grebe *Podiceps cristatus*, Cormorant *Phalacrocorax carbo*, Shelduck *Tadorna tadorna*, Wigeon *Anas penelope*, Teal *Anas crecca*, Pintail *Anas acuta*, Oystercatcher *Haematopus ostralegus*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*, Sanderling *Calidris alba*, Dunlin *Calidris alpina*, Black-tailed Godwit *Limosa limosa islandica*, Bar-tailed Godwit *Limosa lapponica*, Curlew *Numenius arquata* and Redshank *Tringa totanus*.

Non-qualifying species of interest: Leach's Petrel *Oceanodroma leucorhoa*, Little Egret *Egretta garzetta*, Bewick's Swan *Cygnus columbianus bewickii*, Whooper Swan *Cygnus cygnus*, Smew *Mergellus albellus*, Hen Harrier *Circus cyaneus*, Merlin *Falco columbarius*, Peregrine *Falco peregrinus*, Golden Plover *Pluvialis apricaria*, Ruff *Philomachus pugnax*, Wood Sandpiper *Tringa glareola*, Short-eared Owl *Asio flammeus* and Kingfisher *Alcedo atthis* (all Annex 1 species) occur in non-breeding numbers of less than European importance (less than 1% of the GB population).

Status of SPA:
The Dee Estuary was first classified as a Special Protection Area on 17 July 1985. The boundaries and site features were revised on 10 December 2009.

European Site Conservation Objectives for The Dee Estuary Special Protection Area Site Code: UK9013011

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying Conservation Advice document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
A052 *Anas crecca*; Eurasian teal (Non-breeding)
A054 *Anas acuta*; Northern pintail (Non-breeding)
A130 *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A160 *Numenius arquata*; Eurasian curlew (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding)
A193 *Sterna hirundo*; Common tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage

This is a cross border site

This site crosses the border between England and Wales. Some features may only occur in one Country. The advice of Natural Resources Wales should therefore be sought separately.

This is a European Marine Site

This SPA is a part of the Dee Estuary European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS.

Natural England's formal Conservation Advice for European Marine Sites can be found via GOV.UK.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 4). This document updates and replaces an earlier version dated 5 February 2016 to reflect the consolidation of the Habitats Regulations in 2017.

Special Areas of Conservation

Dee Estuary/ Aber Dyfrdwy

Designated Special Area of Conservation (SAC)

Country	England/Wales
Unitary Authority	Cheshire, East Wales, Extra-Regio, Merseyside, West Wales and The Valleys
Centroid*	SJ191819
Latitude	53.32833333
Longitude	-3.216111111
SAC EU Code	UK0030131
Status	Designated Special Area of Conservation (SAC)
Area (ha)	15805.27

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

Location of Dee Estuary/ Aber Dyfrdwy SAC

General site character

- Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins) (81.8%)
- Salt marshes, Salt pastures, Salt steppes (16.1%)
- Coastal sand dunes, Sand beaches, Machair (0.7%)
- Shingle, Sea cliffs, Islets (0.5%)
- Bogs, Marshes, Water fringed vegetation, Fens (0.4%)
- Humid grassland, Mesophile grassland (0.2%)
- Improved grassland (0.1%)
- Broad-leaved deciduous woodland (0.1%)
- Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (0.1%)

Download the Standard Data Form for this site as submitted to Europe (PDF <100kb)

Note When undertaking an appropriate assessment of impacts at a site, all features of European importance (both primary and non-primary) need to be considered.

Annex I habitats that are a primary reason for selection of this site

- **1140 Mudflats and sandflats not covered by seawater at low tide**
  Species occurrence description not yet available.

- **1310 Salicornia and other annuals colonizing mud and sand**

  The Dee Estuary is representative of pioneer glasswort *Salicornia* spp. saltmarsh in the north-west of the UK. *Salicornia* spp. saltmarsh forms extensive stands in the Dee, especially on the more sandy muds where there is reduced tidal scour. It mainly occurs on the seaward fringes as a pioneer community, and moving landwards usually forms a transition to common saltmarsh-grass *Puccinellia maritima* saltmarsh (SM10). There is also a low frequency of *Salicornia* spp. extending well inland. Associated species often include annual sea-blite *Suaeda maritima* and hybrid scurvy grass *Cochlearia x hollandica*.

- **1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
  The Dee Estuary is representative of **H1330 Atlantic salt meadows** in the north-west of the UK. It forms the most extensive type of saltmarsh in the Dee, and since the 1980s it has probably displaced very large quantities of the non-native common cord-grass *Spartina anglica*. The high accretion rates found in the estuary are likely to favour further development of this type of vegetation. The saltmarsh is regularly inundated by the sea; characteristic salt-tolerant perennial flowering plant species include common saltmarsh-grass *Puccinellia maritima*, sea aster *Aster tripolium*, and sea arrowgrass *Triglochin maritima*. In a few areas there are unusual transitions to wet woodland habitats.

Annex I habitats present as a qualifying feature, but not a primary reason for

selection of this site

- **1130 Estuaries**
- **1210 Annual vegetation of drift lines**
- **1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts**
- **2110 Embryonic shifting dunes**
- **2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"**
- **2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" * Priority feature**
- **2190 Humid dune slacks**

Annex II species that are a primary reason for selection of this site

- Not Applicable

Annex II species present as a qualifying feature, but not a primary reason for site selection

- **1095 Sea lamprey** *Petromyzon marinus*
- **1099 River lamprey** *Lampetra fluviatilis*
- **1395 Petalwort** *Petalophyllum ralfsii*

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

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EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	River Dee and Bala Lake
Unitary Authority/County:	Cheshire, Denbighshire, Flintshire, Gwynedd, Shropshire, Wrexham
SAC status:	English part designated on 1 April 2005 Welsh part designated on 13 December 2004
Grid reference:	SJ422503
SAC EU code:	UK0030252
Area (ha):	1308.93
Component SSSI:	Afon Dyfrdwy (River Dee) SSSI, Llyn Tegid SSSI, River Dee (England) SSSI

Site description:

The River Dee has its source in Snowdonia at the outflow of Llyn Tegid and it includes the Ceiriog, Meloch, Tryweryn and Mynach tributaries. Its catchment contains a wide spectrum of landscape from high mountains around Bala, rugged peaks near Llangollen, steep sided wooded valleys, and the plains of Cheshire, Flintshire, north Shropshire and Wrexham. There is a tidal influence as far upstream as Farndon and high tides regularly exceed the Chester weir crest level.

The aquatic plant community includes Wirtgen's water-crowfoot *Ranunculus x bachii* and pond water-crowfoot *R. peltatus*, and also floating water-plantain *Luronium natans*. Water-crowfoot forms extensive beds along the whole length of the Dee where flow conditions are suitable. Other aquatic plants which occur within the site include intermediate water-starwort *Callitriche hamulata*, alternate-flowered water-milfoil *Myriophyllum alterniflorum* and bryophytes including *Rhynchostegium riparoides* and *Fontinalis antipyretica.* Marginal vegetation consists mainly of reed canary-grass *Phalaris arundinacea* with occasional branched bur-reed *Sparganium erectum*.

There is good tree cover along the banks of the River Dee and the tributaries, with the Ceiriog being tree lined on both banks along much of its length. The dominant species are alder *Alnus glutinosa* and willow *Salix* spp., with occasional ash *Fraxinus excelsior* and oak *Quercus* spp. Where sections of the riverbank have been fenced off the vegetation tends to be dominated by bramble *Rubus fruticosus* agg., nettles *Urtica dioica* and other tall ruderals.

The River Dee is recognised as one of North Wales' premier rivers for Atlantic salmon *Salmo salar*. The Mynach, Meloch and Ceiriog tributaries are the most important salmon spawning tributaries in the Dee catchment. Other migratory fish utilising the river system include river lamprey *Lampetra fluviatilus* and sea lamprey *Petromyzon marinus*. The Dee also supports important populations of non-migratory fish including bullhead *Cottus gobio* and brook lamprey *Lampetra planeri*. The otter *Lutra lutra* is well established throughout the river system, especially where appropriate bank side cover exists.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot)

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Atlantic salmon *Salmo salar*
- Brook lamprey *Lampetra planeri*
- Bullhead *Cottus gobio*
- Floating water-plantain *Luronium natans*
- Otter *Lutra lutra*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0030252
Date of registration: 14 June 2005

Signed: [redacted]

On behalf of the Secretary of State for Environment, Food and Rural Affairs

The site is also entered in the Register of European sites for Wales, maintained by the National Assembly for Wales.

European Site Conservation Objectives for River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid Special Area of Conservation Site code: UK0030252

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats and habitats of qualifying species**
- **The structure and function (including typical species) of qualifying natural habitats**
- **The structure and function of the habitats of qualifying species**
- **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**
- **The populations of qualifying species, and,**
- **The distribution of qualifying species within the site.**

This document should be read in conjunction with the accompanying Supplementary Advice document (where available), which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H3260. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; Rivers with floating vegetation often dominated by water-crowfoot

S1095. *Petromyzon marinus*; Sea lamprey

S1096. *Lampetra planeri*; Brook lamprey

S1099. *Lampetra fluviatilis*; River lamprey

S1106. *Salmo salar*; Atlantic salmon

S1163. *Cottus gobio*; Bullhead

S1355. *Lutra lutra*; Otter

S1831. *Luronium natans*; Floating water-plantain

This is a cross border site

This site crosses the border between England and Wales. Some features may only occur in one Country. The advice of Natural Resources Wales should therefore be sought separately.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 4). This document updates and replaces an earlier version dated 5 February June 2016 to reflect the consolidation of the Habitats Regulations in 2017.

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

FLINTSHIRE **MYNYDD Y FFLINT/FLINT MOUNTAIN**

Date of Notification: 19 May 2011

National Grid Reference: SJ 243709

OS Maps: 1:50,000 Sheet number: 116
1:10,000 Sheet number: SJ27SW

Site Area: 25.79ha

Description

The site is of special interest for its stands of unimproved neutral grassland and semi-natural broadleaved woodland, which occur in association with scrub, fen-meadow and swamp vegetation. Mynydd y Fflint/Flint Mountain SSSI is located 1km to the south of Flint, north of the village of Flint Mountain, at an altitude ranging from 35 - 70m.

The site follows the course of a brook within a valley with gentle slopes extending on either side. The slopes are free draining, with the underlying geology consisting of mudstones of the Upper Carboniferous Period, which are overlain by mostly till with some glacial sands and gravels.

The neutral grassland areas on the drier slopes are of high floristic quality and hold a range of grasses, including red fescue *Festuca rubra*, sweet vernal-grass *Anthoxanthum odoratum*, common bent *Agrostis capillaris*, Yorkshire fog *Holcus lanatus*, and crested dog's-tail *Cynosurus cristatus*. Herbs are prominent, with frequent to abundant common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata* and red clover *Trifolium pratense*, and frequent field woodrush *Luzula campestris* and bulbous buttercup *Ranunculus bulbosus*. Some notable plants include pale flax *Linum bienne* and an inland population of rest harrow *Ononis repens*.

Alder *Alnus glutinosa* with grey willow *Salix cinerea* dominates the large areas of semi-natural broadleaved woodland found mainly along the valley bottom. The ground flora varies greatly with areas dominated by great horsetail *Equisetum telmateia* with extensive beds of lesser pond sedge *Carex acutiformis* with scattered marsh willowherb *Epilobium palustre*; whilst other areas have frequent ivy *Hedera helix* with bramble *Rubus fruticosus* and yellow archangel *Lamiastrum galeobdolon*.

In places the vegetation grades into swamp dominated by lesser pond sedge *Carex acutiformis*, with scattering of associates such as water mint *Mentha aquatica*, great willowherb *Epilobium hirsutum*, marsh horsetail *Equisetum palustre*, and marsh marigold *Caltha palustris*. This in turn gives way to areas of rich mixed fen with the addition of the locally uncommon greater tussock sedge *Carex paniculata* and sneezwort *Achillea ptarmica*. Some notable associated species in this vegetation included figwort *Scrophularia nodosa*, and hemp agrimony *Eupatorium*

cannabinum.

The transition between the vegetation communities is well developed with small areas of fen-meadow dominated by the locally uncommon blunt flowered rush *Juncus subnodulosus* accompanied by fen bedstraw *Galium uliginosum*, angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria*, marsh valerian *Valeriana dioica* and marsh thistle *Cirsium palustr*e. Mynydd y Fflint/Flint Mountain is only the second known site for this fen-meadow community in the North East Wales.

The site also supports a variety of other semi-natural vegetation types including areas bracken, scrub and other broadleaved woodland communities.

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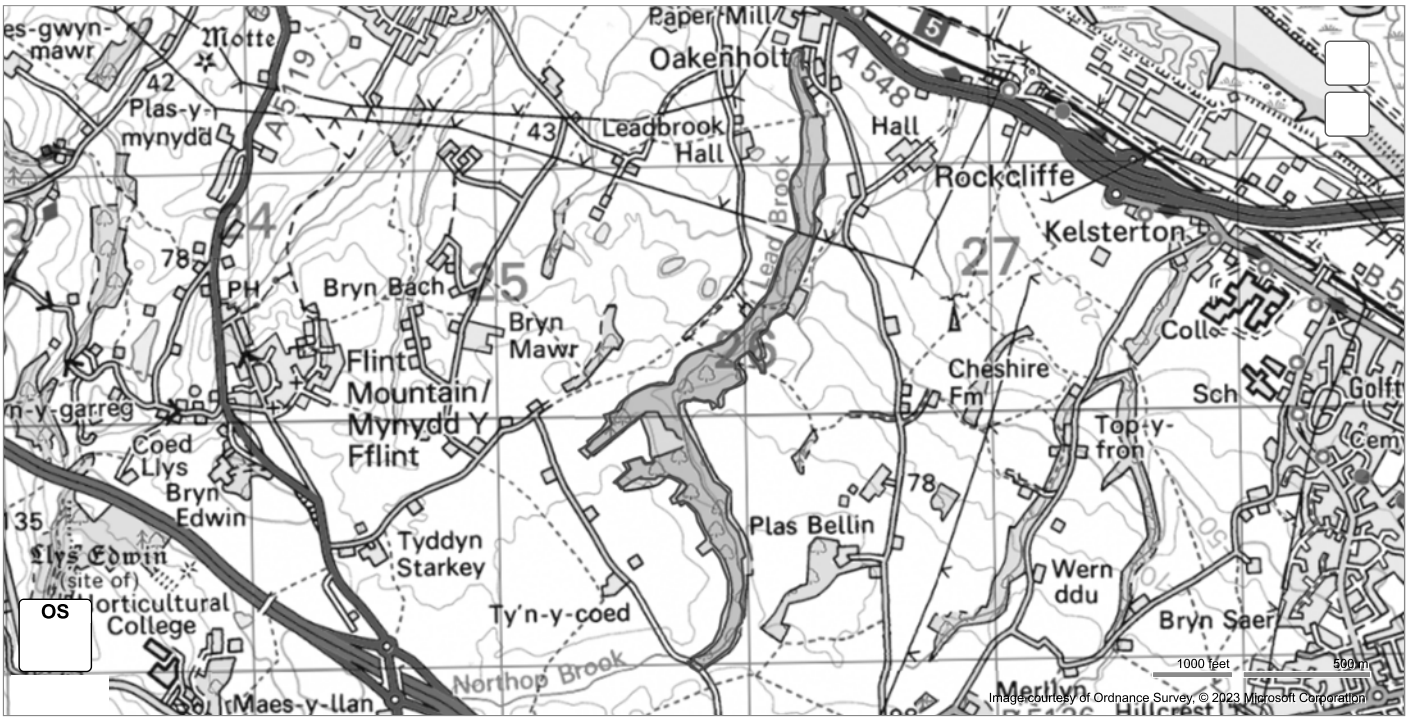
Safleol

A Local Sites System for Wales

26NE10: Leadbrook Wood

Location:	Flintshire
Centroid Grid Reference:	SJ259701
Area:	35.1 ha
Site Description:	Semi-natural broad-leaved woodland occupying the dingles in which the Lead Brook and its tributaries flow. In several areas drainage is impeded. The woodland canopy is mainly dominated by ash and sycamore with some oak alder, beech, common lime and silver birch. The shrub layer has abundant holly, hazel and wych elm. Also present are hawthorn and grey willow. The ground flora has frequent dog's mercury, bramble, wood anemone, enchanter's nightshade, bluebell, opposite-leaved golden saxifrage and wood speedwell. In wet areas of the southern part of the wood, marsh marigold, giant horsetail and meadowsweet are prominent. The northern tip of the woodland is mixed. In the north, the woodland surrounds a reservoir and alder and oak are dominant with hemlock water-dropwort, yellow flag and figwort. Near Ty'n-y-coed there is a semi-improved and a species-rich marshy grassland, with oval sedge, ragged robin, common spotted orchid, sharp-flowered rush, cuckoo flower, carnation sedge and meadowsweet. On the slope above this is a herb-rich meadow with pignut, black knapweed, cat's-ear, crested dog's tail and sweet vernal grass.
Habitats:	Broad-leaved semi-natural woodland (30.241 ha), Mixed plantation (1.57 ha), Semi-improved neutral grassland (0.721 ha), Marsh/marshy grassland (0.438 ha), Swamp (0.278 ha), Standing water (1.945 ha)
Designation Reason:	Broad-leaved woodland and scrub, Pasture/meadow and scrub

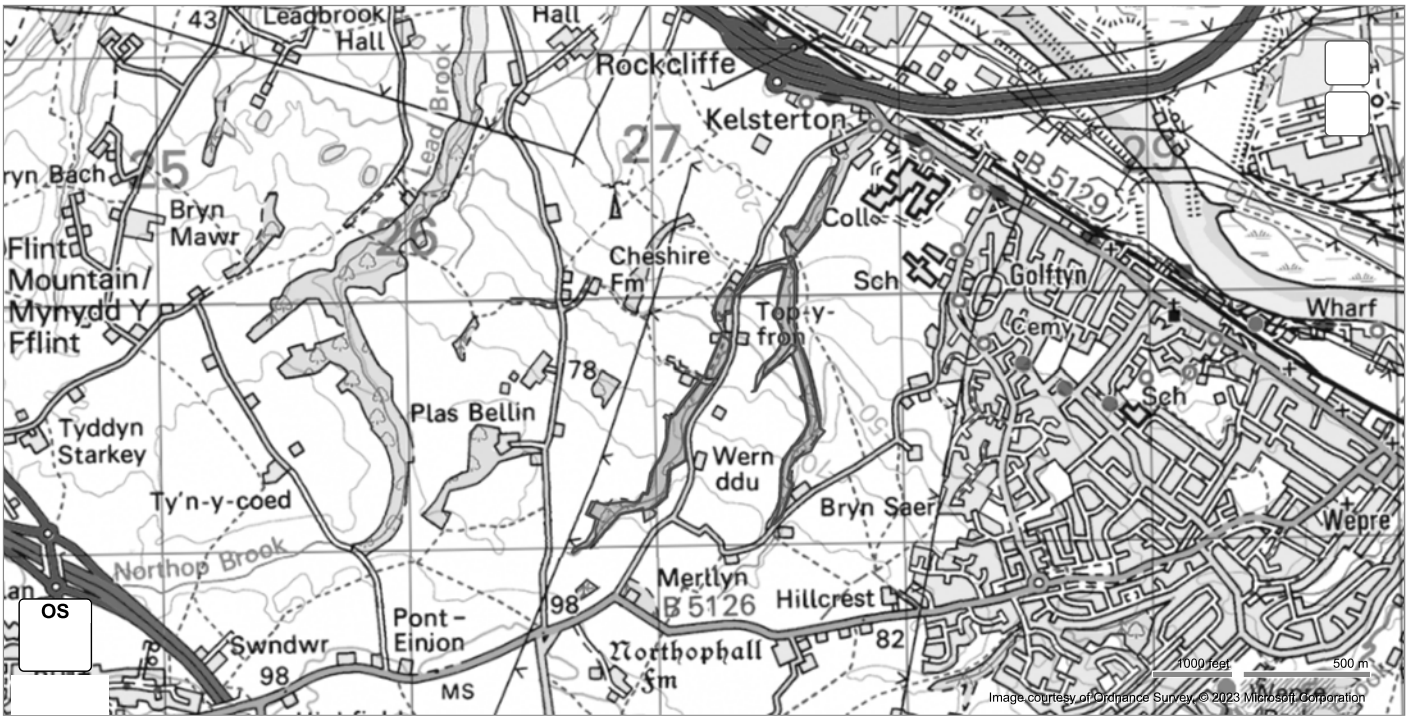


Safleol

A Local Sites System for Wales

26NE09: Top-y-fron Dingle and Kelserton Brook

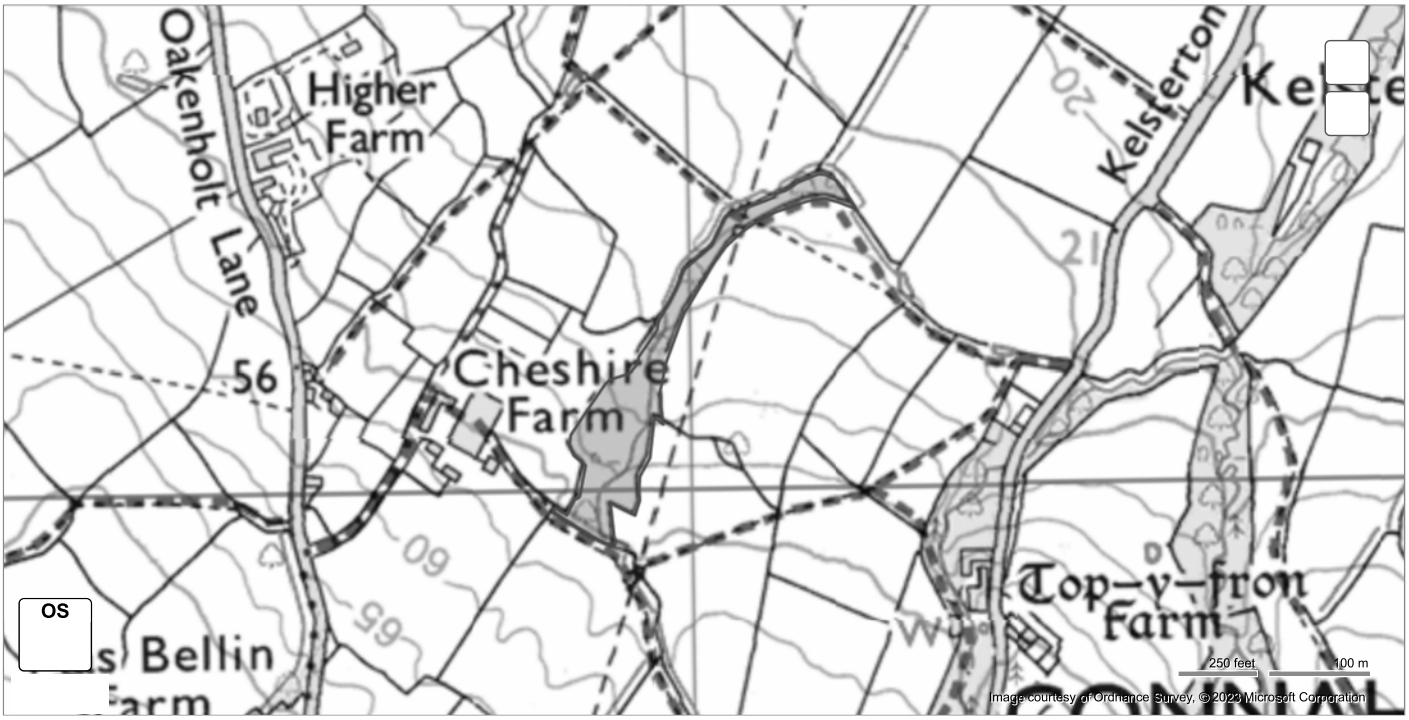
Location:	Flintshire
Centroid Grid Reference:	SJ273696
Area:	16.4 ha
Site Description:	Semi-natural broad-leaved woodland occupying two narrow steep-sided steam valleys that join into one south of Kelsterton. The dominant woodland canopy species is sycamore, but sessile oak, alder, ash and birch are all locally dominant. The Kelsterton Brook section also has common lime and yew. The shrub layer is variable. Top-y-Fron Dingle has a shrub layer of holly, hazel, elder and canopy saplings. The northern section of Kelsterton Brook lacks a shrub layer and the southern section has abundant elder but rhododendron and other introduced species are locally dominant. There is a rich herb flora. In Top-y-Fron Dingle bramble, ramsons, opposite-leaved golden saxifrage, dog's mercury, wood sorrel and bryophytes are all frequent. The herb layer in the Kelsterton Dingle has frequent wood speedwell, dog's mercury, red campion with some nettle, bramble, bluebell, ramsons and rough meadow-grass. The northern part is dominated by rough meadow-grass.
Habitats:	Broad-leaved semi-natural woodland (16.335 ha)
Designation Reason:	Broad-leaved woodland and scrub



Safleol
A Local Sites System for Wales

27SE01: Cheshire Farm Wood

Location:	Flintshire
Centroid Grid Reference:	SJ269701
Area:	1.6 ha
Site Description:	Semi-natural broad-leaved woodland following the course of a small stream. The woodland canopy is dominated by sessile oak with some beech, sycamore and ash. The shrub layer contains wych elm, hawthorn, hazel and beech. The ground flora has abundant wood melick, soft grass and bluebell with pignut, wood anemone, wood speedwell, bramble and greater stitchwort.
Habitats:	Broad-leaved semi-natural woodland (1.617 ha)
Designation Reason:	Broad-leaved woodland and scrub



Appendix 6322/2:

Evaluation Methodology

Evaluation Methodology

1. The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[1].

Importance of Ecological Features

2. Ecological features within the site/study area have been evaluated in terms of whether they qualify as 'important ecological features'. In this regard, CIEEM guidance states that *"it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable".*

3. Various characteristics contribute to the importance of ecological features, including:

- Naturalness;
- Animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- Ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity;
- Habitat connectivity and/or synergistic associations;
- Habitats and species in decline;
- Rich assemblages of plants and animals;
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

4. As an objective starting point for identifying important ecological features, European, national and local governments have identified sites, habitats and species which form a key focus for biodiversity conservation in the UK, supported by policy and legislation. These are summarised by CIEEM guidance as follows:

Designated Sites

- Statutory sites designated or classified under international conventions or European legislation, for example World Heritage Sites, Biosphere Reserves, Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA);

[1] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*', Chartered Institute of Ecology and Environmental Management, Winchester

- Statutory sites designated under national legislation, for example Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
- Locally designated wildlife sites, e.g. Local Wildlife Sites (LWS).

Biodiversity Lists

- Habitats and species of principal importance for the conservation of biodiversity in England and Wales (largely drawn from UK BAP priority habitats and priority species), often referred to simply as Priority Habitats / Species;
- Local BAP priority species and habitats.

Red Listed, Rare, Legally Protected Species

- Species of conservation concern, Red Data Book (RDB) species;
- Birds of Conservation Concern;
- Nationally rare and nationally scarce species;
- Legally protected species.

5. In addition to this list, other features may be considered to be of importance on the basis of local rarity, where they enable effective conservation of other important features, or play a key functional role in the landscape.

<u>Assigning Level of Importance</u>

6. The importance of an ecological feature should then be considered within a defined geographical context. Based on CIEEM guidance, the following frame of reference is used:

- International (European);
- National;
- Regional;
- County;
- District;
- Local (e.g. Parish or Neighbourhood);
- Site (not of importance beyond the immediate context of the site).

7. Features of 'local' importance are those considered to be below a district level of importance, but are considered to appreciably enrich the nature conservation resource or are of elevated importance beyond the context of the site.

8. Where features are identified as 'important' based on the list of key sites, habitats and species set out above, but are very limited in extent or quality (in terms of habitat resource or species population) and do not appreciably contribute to the biodiversity interest beyond the context of the site, they are considered to be of 'site' importance.

9. In terms of assigning the level of importance, the following considerations are relevant:

Designated Sites

10. For designated sites, importance should reflect the geographical context of the designation (e.g. SAC/SPA/Ramsar sites are designated at the international level whereas SSSIs are designated at the national level). Consideration should be given to multiple designations as appropriate (where an area is subject to differing levels of nature conservation designations).

Habitats

11. In certain cases, the value of a habitat can be measured against known selection criteria, e.g. SAC selection criteria, 'Guidelines for the selection of biological SSSIs' and the Hedgerows Regulations 1997. However, for the majority of commonly encountered sites, the most relevant habitat evaluation will be at a more localised level and based on relevant factors such as antiquity, size, species-diversity, potential, naturalness, rarity, fragility and typicalness (Ratcliffe, 1977). The ability to restore or re-create the habitat is also an important consideration, for example in the case of ancient woodland.

12. Whether habitats are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Habitats of Principal Importance' or 'Priority Habitats', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular habitat under a BAP does not in itself imply any specific level of importance.

13. Habitat inventories (such as habitat mapping on the MAGIC database) or information relating to the status of particular habitats within a district, county or region can also assist in determining the appropriate scale at which a habitat is of importance.

Species

14. Deciding the importance of species populations should make use of existing criteria where available. For example, there are established criteria for defining nationally and internationally important populations of waterfowl. The scale within which importance is determined could also relate to a particular population, e.g. the breeding population of common toads within a suite of ponds or an otter population within a catchment.

15. When determining the importance of a species population, contextual information about distribution and abundance is fundamental, including trends based on historical records. For example, a species could be considered particularly important if it is rare and its population is in decline. With respect to rarity, this can apply across the geographic frame of reference and particular regard is given to populations where the UK holds a large or significant proportion of the international population of a species.

16. Whether species are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Species of Principal Importance' or 'Priority Species', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular species under a BAP does not in itself imply any specific level of importance.

17. Species populations should also be considered in terms of the potential zone of influence of the proposals, i.e. if the entire species population within the site and surrounding area were to be affected by the proposed development, would this be of significance at a local, district, county or wider scale? This should also consider the foraging and territory ranges of individual species (e.g. bats roosting some distance from site may forage within site whereas other species such as invertebrates may be more sedentary).

Appendix 6322/3:

Legislation Summary

LEGISLATION SUMMARY

1. In England and Wales primary legislation is made by the UK Parliament, and in Scotland by the Scottish Parliament, in the form of Acts. The main piece of legislation relating to nature conservation in the UK is the Wildlife and Countryside Act 1981 (as amended).

2. Acts of Parliament confer powers on Ministers to make more detailed orders, rules or regulations by means of secondary legislation in the form of statutory instruments. Statutory instruments are used to provide the necessary detail that would be too complex to include in an Act itself[1]. The provisions of an Act of Parliament can also be enforced, amended or updated by secondary legislation.

3. In summary, the key pieces of legislation relating to nature conservation in the UK are:

    - Wildlife and Countryside Act 1981 (as amended)
    - Protection of Badgers Act 1992
    - Hedgerows Regulations 1997
    - Countryside and Rights of Way (CRoW) Act for England and Wales 2000
    - Natural Environment and Rural Communities Act 2006
    - Conservation of Habitats and Species Regulations 2017

4. A brief summary of the relevant legislation is provided below. The original Acts and instruments should be referred to for the full and most up to date text of the legislation.

5. **Wildlife and Countryside Act 1981 (as amended)**. The WCA Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) identified for their flora, fauna, geological or physiographical features. The Act contains strict measures for the protection and management of SSSIs.

6. The Act also refers to the treatment of UK wildlife including protected species listed under Schedules 1 (birds), 5 (mammals, herpetofauna, fish, invertebrates) and 8 (plants).

7. Under Section 1(1) of the Act, all wild birds are protected such that is an offence to intentionally:

    - Kill, injure or take any wild bird;
    - Take, damage or destroy the nest of any wild bird whilst in use* or being built;
    - Take or destroy an egg of any wild bird.

    * The nests of birds that re-use their nests as listed under Schedule ZA1, e.g. Golden Eagle, are protected against taking, damage or destruction irrespective of whether they are in use or not.

8. Offences in respect of Schedule 1 birds are subject to special, i.e. higher, penalties. Schedule 1 birds also receive greater protection such that it is an offence to intentionally or recklessly:

    - Disturb any wild bird included in Schedule 1 while it is building a nest or while it is in, on or near a nest containing eggs or young;
    - Disturb dependent young of such a bird.

[1] http://www.parliament.uk/business/bills-and-legislation/secondary-legislation/statutory-instruments/

9. Under Section 9(1) of the Act, it is an offence to:

- Intentionally kill, injure or take any wild animal included in Schedule 5.

10. In addition, under Section 9(4) it is an offence to intentionally or recklessly:

- Obstruct access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection; or
- Disturb any wild animal included in Schedule 5 while occupying a structure or place which it uses for that purpose.

11. Under Section 13(1) it is an offence:

- To intentionally pick, uproot or destroy any wild plant listed in Schedule 8; or
- Unless the authorised person, to intentionally uproot any wild plant not included in Schedule 8.

12. The Act also contains measures (S.14) for preventing the establishment of non-native species that may be detrimental to native wildlife, prohibiting the introduction into the wild of animals (releases or allows to escape) and plants (plants or causes to grow) listed under Schedule 9.

13. **Protection of Badgers Act 1992.** The Act aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. It should be noted that the legislation is not intended to prevent properly authorised development. Under the Act it is an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat* a Badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett# (this includes disturbing Badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

* the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence

\# A sett is defined as "*any structure or place which displays signs indicating current use by a Badger*". Natural England advice (June 2009) is that a sett is protected so long as such signs remain present, which in practice could potentially be for some time after the last actual occupation by Badger. Interference with a sett includes blocking tunnels or damaging the sett in any way

14. Licences can be obtained from the Statutory Nature Conservation Organisation (SNCO) for development activities that would otherwise be unlawful under the legislation, provided there is suitable justification. The SNCO for England is Natural England.

15. **Hedgerows Regulations 1997**. 'Important' hedgerows (as defined by the Regulations) are protected from removal (up-rooting or otherwise destroying). Various criteria specified in the Regulations are employed to identify 'important' hedgerows for wildlife, landscape or historical reasons.

16. **Countryside and Rights of Way (CRoW) Act for England and Wales 2000.** The CRoW Act provides increased measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation. Schedule 12 of the Act amends the species provisions of the WCA 1981, strengthening the legal protection for threatened species. The Act also introduced a duty on Government to have regard to the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

17. **Natural Environment and Rural Communities Act 2006.** Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as local planning authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when exercising their normal functions. 56 habitats and 943 species of principal importance are included on the S41 list. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan (BAP).

18. **Conservation of Habitats and Species Regulations 2017 (as amended).** The Regulations enact the European Union's Habitats Directive (92/43/EEC) in the UK. The Habitats Directive was designed to contribute to the maintenance of biodiversity within member states through the conservation of sites, known in the UK as Special Areas of Conservation (SACs), containing habitats and species selected as being of EC importance (as listed in Annexes I and II of the Habitats Directive respectively). Member states are required to take measures to maintain or restore these natural and semi-natural habitats and wild species at a favourable conservation status.

19. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs)[2] classified under Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). These sites constitute the Natura 2000 network. The Regulations impose restrictions on planning decisions likely to significantly affect SPAs or SACs.

20. The Regulations also provide protection to European Protected Species of animals that largely overlaps with the WCA 1981, albeit the provisions are generally stricter. Under Regulation 43 it is an offence, *inter alia*, to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species;
- Deliberately disturb any wild animals of any such species, including in particular any disturbance likely to impair their ability to survive, to breed or reproduce, to rear or nurture their young, to hibernate or migrate, or which is likely to affect significantly their local distribution or abundance;
- Deliberately take or destroy the eggs of such an animal;
- Damage or destroy a breeding site or resting place of such an animal.

21. Similar protection is afforded to European Protected Species of plants, as detailed under Regulation 47.

22. The Regulations do provide a licensing system that permits otherwise illegal activities in relation to European Protected Species, subject to certain tests being fulfilled.

[2] Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC) (aka the Birds Directive), which came into force in April 1979. SPAs are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.

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Connah's Quay Power Station:
Northern Land Parcel

Breeding, Passage and Wintering Bird Surveys

July 2023

Quality Management	
Client:	Uniper UK Ltd
Project:	Connah's Quay Power Station: Northern Land Parcel
Report Title:	Breeding, Passage and Wintering Bird Surveys
Project Number:	ECO-6322
File Reference:	6322 Birds North 2023 dv3 /ADB
Date:	10/07/2023

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Legal Guidance

The information set out within this report in no way constitutes a legal opinion on the relevant legislation (refer to the relevant Appendix for the main provisions of the legislation). The opinion of a legal professional should be sought if further advice is required.

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Executive Summary

i) **Introduction.** Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake baseline ecological surveys of the Northern Land Parcel at Connah's Quay Power Station, Connah's Quay, Flintshire.

ii) **Survey.** Breeding, wintering and passage bird surveys were undertaken at the site from April 2022 to February 2023.

iii) **Ecological Designations.** The site lies adjacent to the statutory designation River Dee Estuary (SPA, Ramsar and SAC). This is a vast site designated for its wintering and passage birds which extends substantially from the site's northern and western boundaries. Outside the site boundary, field F1 which falls within the SAC is described as a "nature reserve". This area contains several ponds that support wetland birds.

iv) **Habitats.** The site comprises areas of rough pasture and improved grassland, scrub, ponds, tall ruderal vegetation, hardstanding, hedgerows and tree lines.

v) **Survey Findings.** Two of the four Annex 1 species relevant to the SPA/Ramsar site were recorded in significant numbers in the estuary adjacent to the site. Of the qualifying migratory species, seven were recorded in the estuary in significant numbers: Redshank, Shelduck, Teal, Pintail, Oystercatcher, Dunlin and Black-tailed Godwit. Curlew, Knot and Grey Plover were present in relatively low numbers. All of these species were typically observed widespread within the estuary and none were recorded within the site. Teal, Pintail and Black-tailed Godwit were recorded within the nature reserve outside the site in significant numbers, all during the autumn.

[redacted] Other

Species breeding in terrestrial habitats within the site and adjacent areas all remain common and widespread in both a local and national context.

1 Introduction

1.1 Background and Proposals

1.1.1 Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake a desk study and baseline ecological surveys of the Northern Land Parcel at Connah's Quay Power Station, Connah's Quay, approximately centred at grid reference SJ 270 716 (see Plan 6322/ECO1), hereafter referred to as 'the site'.

1.1.2 Breeding, Wintering and Passage bird surveys were undertaken at the site from April 2022 to February 2023.

1.2 Site Overview

1.2.1 The site is located in north-east Flintshire in North Wales (see Plan 6322/ECO1). The site is bounded to the north-east by the River Dee, beyond which extend large areas of open wetland associated with the River Dee Estuary. Connah's Quay Power Station is located immediately adjacent to the site's south-eastern boundary and a railway line and industrial development, with associated planting, forms the site's southern boundary.

1.2.2 The site itself comprises grassland fields with roads, treelines, hedgerows, along with areas of scrub and tall ruderal vegetation. Beyond the site, an adjacent field (**F1**) contains three ponds.

1.2.3 The site is located immediately south of the River Dee estuary where saltmarsh and grazing marsh extends to the north and east within the River Dee Special Protection Area (SPA) and Ramsar site.

1.3 Purpose of the Report

1.3.1 This report documents the methods and findings of the desk study and surveys of breeding, passage and wintering birds undertaken. The importance of the habitats and bird species present is evaluated.

2 Methodology

2.1 Data Search

2.1.1 Background information relevant to the site and its immediate surroundings to a distance of 2km was sourced from the North Wales Environmental Information Service (Cofnod) in August 2021. The data obtained comprised information on designated sites and species records.

2.1.2 Information on statutory designations was obtained from the MAGIC database[1], which uses data provided by Natural England, from within an extended search area of 25km. The MAGIC database was also searched for the presence of Priority Habitats within or adjacent to the site. Relevant information is reproduced in Appendix 6322/1 and on Plan 6322/ECO2.

2.2 Bird Surveys

2.2.1 Monthly surveys were carried out from April 2022 until February 2023 in order to assess breeding bird activity (April to July), passage activity (April, May and July to November) and winter activity (November to February) at the site and adjacent areas. The times, tide state and weather conditions during all surveys are shown in Table 2.1 below.

Table 2.1. Tide and weather conditions during the bird surveys.

Survey Date	Time of Survey	Tide and Weather Conditions					
		High Tide (time, ht)	Tide State	Wind (direction, speed BF)	Temp (°C)	Cloud Cover (/8)	Rain
25/04/2022	05:00-09:00	07:28 (3.1m)	High	NE, 1	4	1/8	Dry
20/05/2022	09:30-15:20	15:16 (4.1m)	Rising/high	S, 2	15	7-8/8	Dry
12/06/2022	10:20-14:50	10:04 (4.1m)	High/Falling	SW, 3	16	6/8	Dry
25/07/2022	08:45-13:10	10:03 (3.1m)	High/Falling	SW, 3	16	8/8	Drizzle
15/08/2022	10:15-15:40	14:32 (4.5m)	Rising/high	SW, 1	18	8/8	Showers
06/09/2022	12:20-16:50	08:08 (3.0m)	Low	S, 3	21	3/8	Showers
10/10/2022	09:15-15:30	12:22 (4.7m)	High/Falling	NW, 4	13	4/8	Dry
07/11/2022	08:00-12:50	10:23 (4.4m)	High	SW, 3	12	8/8	Dry
15/12/2022	10:35-15:35	15:37 (3.2m)	Rising/high	N, 1	-2	0/8	Dry
24/01/2023	11:00-15:25	13:01 (5.1m)	High	No wind	2	8/8	Dry
21/02/2023	13:45-18:00	11:57 (5.2m)	Low	W, 3	10	6/8	Dry

BF = Beaufort Force: BF0 = calm, BF12 = hurricane force

2.2.2 On each survey an experienced ornithologist walked a circuitous route around the site boundary recording the locations, numbers and activity of all birds present in (and around) the areas during this time.

[1] Multi-Agency Geographic Information for the Countryside (MAGIC), https://magic.defra.gov.uk/

2.2.3 Surveys revealed large numbers of birds using the River Dee estuary, with thousands of birds visible as far as the eye could see, as well as on saltmarsh on the far (north) side. Therefore, in order to make the surveys manageable and relevant to the sites, counts were limited to an area extending into this area to approximately 400-800m from the site boundary as shown on Plan 6322/ECO5. This area extended up to approximately 800m from the site boundary, but did not include the far bank of the River Dee. Counts of birds on the estuary and River Dee were primarily made from the hide at the north end of the site.

2.2.4 This methodology ensures that the vast majority of species that use the site would have been recorded over the course of the surveys, although some species that may use the site as part of a larger territory may potentially be overlooked, particularly nocturnal species such as owls.

2.2.5 To determine the breeding status of birds using the site, the following criteria were applied following the methodology used in the 'Atlas' surveys of 1988-1991 (Gibbons et al, 1993). This method accepts the following activities as denoting breeding (including those probably breeding although definite proof was lacking):

- Bird apparently holding territory, including courtship and display;
- Nest-building (including excavating nest-hole);
- Distraction display or feigning injury;
- Adult carrying faecal sac or food;
- Adult entering or leaving apparently occupied nest site;
- Nest with eggs or eggshells found, or bird sitting but not disturbed; and
- Nest with young; or downy/recently fledged young.

2.2.6 In order to ensure that robust data relating to the site and the River Dee estuary was obtained, most surveys were timed to coincide with high tide (to enable observation of high tide roosts of species using the SPA/Ramsar site when feeding areas are covered by water). During the course of all surveys, all states of tide were surveyed.

2.3 Ecological Evaluation Methodology

2.3.1 The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018)[2], which involves identifying 'important ecological features' within a defined geographical context (i.e. international, national, regional, county, district, local or site importance). Further detail is provided in Appendix 6322/2.

[2] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*', ver. 1.1, Chartered Institute of Ecology and Environmental Management, Winchester

2.4 National Policy Approach to Biodiversity in the Planning System

2.4.1 National Planning Policy in Wales is set out in Planning Policy Wales (PPW)[3]. This describes policies designed to maximise environmental protection and limit environmental impact including the promotion of resilient biodiversity and ecosystems, citing biodiversity as an element in the delivery of distinctive and natural places, and ensuring environmental sustainability through good design.

2.4.2 PPW sets out a framework for the sustainable management of natural resources, which within which the planning system contribute by:

'• improving the resilience of ecosystems and ecological networks;

• halting and reversing the loss of biodiversity;

• maintaining and enhancing green infrastructure based on seeking multiple ecosystem benefits and solutions;' amongst other measures.

2.4.3 PPW embeds the protection and enhancement of biodiversity within all components of the planning system in Wales, stating that:

'Biodiversity loss should be reversed, pollution reduced, environmental risks addressed and overall resilience of ecosystems improved.'

2.4.4 The approach to dealing with biodiversity in the context of planning applications is set out on Section 6.4, stating:

'The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.'

and

'Development plan strategies, policies and development proposals must consider the need to:

• support the conservation of biodiversity, in particular the conservation of wildlife and habitats;

• ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;

• ensure statutorily and non-statutorily designated sites are properly protected and managed;

• safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and

[3] Llywodraeth Cymru/Welsh Government (2021). *'Planning Policy Wales'*, Edition 11, February 2021.

• secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.'

'All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission.'

2.4.5 PPW does not currently mandate a target for Biodiversity Net Gain, but does set out that:

'…development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity;'

'…planning decisions should incorporate measures which seek the creation, restoration and appropriate management of green networks and linkages between habitats and maintaining and enhancing other green infrastructure features and networks'.

2.4.6 The above approach encapsulates the 'mitigation hierarchy' described in British Standard BS 42020:2019[4], which involves the following step-wise process:

- **Avoidance –** avoiding adverse effects through good design;
- **Mitigation –** where it is unavoidable, mitigation measures should be employed to minimise adverse effects;
- **Compensation –** where residual effects remain after mitigation it may be necessary to provide compensation to offset any harm; and
- **Enhancement –** planning decisions often present the opportunity to deliver benefits for biodiversity, which can also be explored alongside the above measures to resolve potential adverse effects.

2.4.7 The measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development (BS 42020:2019, section 5.5).

2.5 Local Policy

2.5.1 The Local Policy for Cyngor Sir y Fflint Flintshire County Council is currently set out within the 'Flintshire Local Development Plan 2015 - 2030 (Adopted January 2023)'. Policies that relate specifically to ecology and biodiversity are set out below.

2.5.2 Policy EN2: Green Infrastructure

"Development proposals will be required to protect, maintain and enhance the extent, quality and connectivity of the green infrastructure network, including designated and non-designated green spaces (as shown on the proposals maps and listed in the table below), and where appropriate:

a. Create new green infrastructure linkages from the proposed development to the existing local network;

[4] British Standards Institution (2013) '*Biodiversity – Code of practice for planning and development*', BS 42020:2019

b. *Fill in gaps in the existing network to improve connectivity.*

Where the loss or damage of existing green infrastructure is unavoidable, appropriate mitigation and compensation will be required."

2.5.3 Policy EN3: Undeveloped Coast and Dee Estuary Corridor states:

"Within the undeveloped coast development will only be permitted where:

a. *It can be demonstrated a coastal location is essential;*

b. *It conserves and enhances the open character of the coast;*

c. *It would not unacceptably harm areas of nature conservation, landscape or biodiversity;*

d. *It would not harm existing or proposed recreational or active travel routes;*

e. *Extensive coastal protection measures are not required; and*

f. *It would not be potentially at risk of flooding nor unacceptably increase erosion or flooding or interfere with natural coastal processes."*

2.5.4 Policy EN6: Sites of Biodiversity and Geodiversity Importance states:

"Development will not be permitted that would result in an adverse effect on the integrity of sites of international nature conservation importance. Proposals where adverse effects on site integrity cannot be ruled out would not be supported.

Development likely to impact the special features of a Nationally Designated Site will only be granted in exceptional circumstances where appropriate compensation can be provided. Development proposals that would have a significant adverse effect on locally designated sites or site with other biodiversity and / or geological interest, including priority species, will only be permitted where:

a. *it can be demonstrated that the need for the development outweighs the biodiversity or geological importance of the site; and*

b. *it can be demonstrated that the development cannot reasonably be located elsewhere; and*

c. *any unavoidable harm is minimised by effective mitigation to ensure that there is no reduction in the overall biodiversity value of the area. Where this is not feasible compensation measures designed to create, restore and enhance biodiversity must be provided.*

Development that results in the restoration, enhancement and creation of habitats will be supported especially where this promotes the resilience of ecosystems."

2.5.5 Policy EN7: Development Affecting Trees, Woodlands and Hedgerows states:

"Development proposals that will result in significant loss of, or harm to, trees, woodlands or hedgerows of biodiversity, historic, and amenity value will not be permitted.

Where the impact of development affecting trees, woodlands or hedgerows is considered acceptable, development will only be permitted where:

a. *the development maximises their retention through sensitive design*

b. *measures; and*

c. *where the removal of trees is considered necessary, suitable replacements*

d. *shall be provided elsewhere within the site; and*

e. *it results in a net benefit in biodiversity."*

2.5.6 Policy EN7: Development In or Adjacent to Conservation Areas states:

"Development within or adjacent to a conservation area will only be permitted if it would preserve or enhance the character and appearance of the conservation area or its setting. New development in such locations must also be of a high standard of design, respond to the area's special characteristics, and pay particular regard to:

a. *important views, vistas, street scenes, roofscapes, trees, open spaces, gaps and other features that contribute to the character or appearance of the conservation area;*

b. *the retention of historically significant boundaries or other elements that contribute to the established form of development;*

c. *the relationship to existing buildings and spaces, and pattern of development;*

d. *scale, height and massing, architectural design and detailing, the use of materials, boundary treatment, and public realm materials."*

3 The River Dee Estuary SPA/Ramsar Site

3.1.1 The Dee Estuary is "a large funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. Where agricultural reclamation has not occurred, the saltmarshes grade into transitional brackish swamp vegetation on the upper shore."

3.1.2 The estuary "is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats, including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders" and in summer it "supports nationally important breeding colonies of two species of tern" and "is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for Sandwich terns post-breeding."

3.1.3 The SPA qualifies under article 4.1 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the GB populations of the species listed in Annex 1 (see Table 3.1):

Table 3.1. SPA qualifying bird species (Article 4.1).

Annex 1 Species	Count and Season	% of GB Population
Bar-tailed godwit *Limosa lapponica*	1,150 individuals – wintering	2.2%
Common tern *Sterna hirundo*	392 pairs – breeding	3.2%
Little tern *Sternula albifrons*	69 pairs – breeding	2.9%
Sandwich tern *Thalassia sandvicensis*	957 individuals – autumn passage	2.3%

3.1.4 The SPA qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex 1) (see Table 3.2):

Table 3.2. SPA qualifying migratory bird species (Article 4.2).

Migratory Species	Count and Season	% of Population
Redshank *Tringa totanus*	8,795 individuals – passage	5.9% Eastern Atlantic (wintering)
Shelduck *Tadorna tadorna*	7,725 individuals – wintering	2.6% Northwestern Europe
Teal *Anas crecca*	5,251 individuals – wintering	1.3% Northwestern Europe
Pintail *Anas acuta*	5,407 individuals – wintering	9.0% Northwestern Europe
Oystercatcher *Haematopus ostralegus*	22,677 individuals – wintering	2.5% Europe & N/W Africa (wintering)
Grey plover *Pluvialis squatarola*	1,643 individuals – wintering	1.1% Eastern Atlantic (wintering)
Knot *Calidris canutus*	12,394 individuals – wintering	3.5% NE Can/Grl/Iceland/NW Eur
Dunlin *Calidris alpina*	27,769 individuals – wintering	2.0% N Siberia/Europe/W Africa
Black-tailed godwit *Limosa limosa islandica*	1,747 individuals – wintering	2.5% Iceland (breeding)
Curlew *Numenius arquata*	3,899 individuals – wintering	1.1% Europe (breeding)
Redshank *Tringa totanus*	5,293 individuals – wintering	3.5% Eastern Atlantic (wintering)

Assemblage Qualification

3.1.5 In addition, The Dee Estuary Ramsar site qualifies under article 4.2 of the Directive (79/409/EEC) as it is "used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season."

4 Results

4.1 Legislation

4.1.1 All wild birds and their nests receive protection under Section 1 of the Wildlife and Countryside Act 1981 (as amended) in respect of killing and injury, and their nests, whilst being built or in use, cannot be taken, damaged or destroyed. Species included on Schedule 1 of the Act receive greater protection and are subject to special penalties (see Appendix 6322/3 for detailed provisions).

4.2 Conservation Status

4.2.1 The conservation importance of British bird species is categorised based on a number of criteria including the level of threat to a species' population status[5]. Species are listed as Green, Amber or Red. Red Listed species are considered to be of the highest conservation concern being either globally threatened and or experiencing a high/rapid level of population decline (>50% over the past 25 years). A number of birds are also S41 Priority Species. Red and Amber listed species and priority species should be assessed as important ecological features.

4.3 Survey Results

4.3.1 A total of 111 bird species were recorded during the surveys. The results are divided into "waterbirds" (54) and "landbirds" (57) in the tables that follow. "Waterbirds" include all species that are specifically associated with the estuary habitats, including all waterfowl, waders, gulls and terns. "Landbirds" include all species that are associated with terrestrial habitats.

4.3.2 The numbers of waterbirds recorded during each survey are shown in Table 4.1 below. These are subdivided into those present within the nature reserve and adjacent fields and those observed within the River Dee estuary. Habitats within the site itself are not suitable to support wetland birds.

Table 4.1: Numbers of each species of waterbird recorded during each survey. SPA/Ramsar qualifying species are shown in bold.

Species (and BTO species code)	RSPB listed	Nature Reserve											Dee Estuary SPA/Ramsar										
		A	M	J	J	A	S	O	N	D	J	F	A	M	J	J	A	S	O	N	D	J	F
Canada goose (CG) *Branta canadensis*	Feral	17	62	60	20	100	62					318		90	270	26	300	68	210	1	2000	18	46
Greylag goose (GJ) *Anser anser*	Feral			2								5							3		6		1
Pink-footed goose (PG) *Anser brachyrhynchus*	Amber											1							102		600	150	
Mute swan (MS) *Cygnus olor*		3													1								13
Egyptian goose (EG) *Anser aegyptiaca*	Feral																		1		1		
Shelduck (SU) *Tadorna tadorna*	Amber	9	28	9									15	26	220	20	200	16	53	5	11	20	38

[5] Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) *'Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man'* British Birds *108*, pp.708-746

Species (and BTO species code)	RSPB listed	Nature Reserve											Dee Estuary SPA/Ramsar										
		A	M	J	J	A	S	O	N	D	J	F	A	M	J	J	A	S	O	N	D	J	F
Ruddy shelduck (UD) *Tadorna ferruginea*	Feral																				5		
Shoveler (SV) *Spatula clypeata*	Amber							1	3	200	15	4											
Gadwall (GA) *Mareca strepera*	Amber	14	2	3							2	7											
Wigeon (WN) *Mareca penelope*	Amber		2								7	4							7	13	1000	110	141
Mallard (MA) *Anas platyrhynchos*	Amber	33	200	500	320	300	200	13	4		10	7		2	28	194	2	150		23	10	6	6
Pintail (PT) *Anas acuta*	Amber						300														2		43
Teal (T.) *Anas crecca*	Amber	3			6	100	100	2000	16	2	30	10	7				16	200	4000	900	1750	800	500
Tufted duck (TU) *Aythya fuligula*		4	4	4	6		1		2		4	4											
Goosander (GD) *Mergus merganser*																						1	5
Water rail (WA) *Rallus aquaticus*							1																
Moorhen (MH) *Gallinula chloropus*	Amber	5	1	3	5	4	5	3	6	3	7	4											
Coot (CO) *Fulica atra*		8	11	16	50	10	3		2	13	12	7											
Little grebe (LG) *Tachybaptus ruficollis*		4	1	2	1	3	2			2	1	3											
Great crested grebe (GG) *Podiceps cristatus*													2						1	6	2	1	1
Oystercatcher (OC) *Haematopus ostralegus*	Amber	2	2									1	5	80		14	500	13	350	170	4	500	10
[redacted]																							
Lapwing (L.) *Vanellus vanellus*	Red			1	26	15	170				2					42	25	33	40	1050	154	500	
Golden plover (GP) *Pluvialis apricaria*																				4			
Grey plover (GV) *Pluvialis squatarola*	Amber																			3	1		
Ringed plover (RP) *Charadrius hiaticula*	Red																		2				
Little ringed plover (LP) *Charadrius dubius*	Sch.1	2		1																			
Whimbrel (WM) *Numenius phaeopus*	Sch.1	1											1				1						
Curlew (CU) *Numenius arquata*	Red				17	2	15	18	13	4	42	24	4			17	5	100	26	9	10	20	12
Bar-tailed godwit (BA) *Limosa lapponica*	Amber		1		1																		2
Black-tailed godwit (BW) *Limosa limosa*	Sch.1		52	35	1000	500	400	4		2	15		110		172		200	500	213	2000	30	600	183

Species (and BTO species code)	RSPB listed	Nature Reserve											Dee Estuary SPA/Ramsar										
		A	M	J	J	A	S	O	N	D	J	F	A	M	J	J	A	S	O	N	D	J	F
Ruff (RU) *Calidris pugnax*	Sch.1						4																
Knot (KN) *Calidris canututs*	Amber				2														12	18		50	51
Dunlin (DN) *Calidris alpina*	Red				3					2						3	6		1050	2500	250	2000	800
Curlew sandpiper (CV) *Calidris ferruginea*	Amber																		3				
Snipe (SN) *Gallinago gallinago*	Amber					2	2			1	2									4			
Common sandpiper (CS) *Actitis hypoleucos*	Amber	2																					
Redshank (RK) *Tringa totanus*	Amber									1	1		4			700	600	76	2500	33	10	10	58
Spotted redshank (DR) *Tringa erythropus*	Amber						1												1	4	1		
Greenshank (GK) *Tringa nebularia*	Amber															1	2	3	1				1
Black-headed gull (BH) *Chroicocephalus ridibundus*	Amber	150	150	140	20					120	30		200	50	100	200	300	125	17	27	100	100	105
Little gull (LU) *Hydrocoleus minutus*	Sch.1	1																					
Common gull (CM) *Larus canus*	Amber									1	1									6	6	1	15
Herring gull (HG) *Larus argentatus*	Red												1	6		6	100		67	12	100	2	
Great black-backed gull (GB) *Larus marinus*	Amber															2	7	3			3	2	
Lesser black-backed gull (LB) *Larus fuscus*	Amber												2	10	5	6	6	32	66	65	40	1	2
Common tern (CN) *Sterna hirundo*	Amber													2	16	5	1						
Cormorant (CA) *Phalacrocorax carbo*															1	5	6	5	21	36	6	9	10
Spoonbill (NB) *Platalea leucorodia*	Sch.1																4						
Grey heron (H.) *Ardea cinerea*										6					2	5	3	2	4	2		3	1
Little egret (ET) *Egretta garzetta*															1	26	18	1	11	6		1	5
Great egret (HW) *Egretta alba*	Amber													1		2							1
Kingfisher (KF) *Alcedo atthis*	Sch.1	1																		1	1		
Rock pipit (RC) *Anthus petrosus*																				1		2	

4.3.3 The survey results for landbirds are shown in Table 4.2 below. These include the estimated numbers of territories within the site, and the maxima for passage and winter periods. The distribution of breeding birds is shown in Plan 6322/ECO6.

Table 4.2: Systematic list of 'landbird' species recorded.

Species (and BTO species code)	RSPB listed	North site			Notes
		Est. no. pairs	Passage max.	Winter max.	
Pheasant (PH) *Phasianus colchicus*	Feral	1		2	
Red-legged partridge (RL) *Alectopris rufa*	Feral		2		
Grey partridge (P.) *Perdix perdix*	Red		1		One in April.
Swift (SI) *Apus apus*	Red		20		Flying over.
Stock dove (SD) *Columba oenas*	Amber		8	2	
Wood Pigeon (WP) *Columba palumbus*	Amber	4	7	22	
Sparrowhawk (SH) *Accipiter nisus*	Amber		1	1	Flying over.
Marsh harrier (MR) *Circus aeruginosus*	Sch.1		1	2	
Buzzard (BZ) *Buteo buteo*			1	1	
Kestrel (K.) *Falco tinnunculus*	Amber		1		
Merlin (ML) *Falco columbarius*	Sch.1			1	One in December.
Peregrine (PE) *Falco peregrinus*	Sch.1			1	
Jay (J.) *Garrulus glandarius*			1		
Magpie (MG) *Pica pica*		2		30	
Jackdaw (JD) *Corvus monedula*			50	70	Foraging in fields.
Rook (RO) *Corvus frugilegus*	Amber		40	10	Foraging in fields.
Carrion crow (C.) *Corvus corone*		1		40	
Raven (RN) *Corvus corax*			2	2	
Coal tit (CT) *Periparus ater*		1			
Blue tit (BT) *Cyanistes caeruleus*		2		7	
Great tit (GT) *Parus major*		1		6	
Skylark (S.) *Alauda arvensis*	Red		1	8	Flying over.
Swallow (SL) *Hirundo rustica*	Amber		20		Flying over.
House martin (HM) *Delichon urbicum*	Amber		20		Flying over.
Cetti's warbler (CW) *Cettia cetti*	Sch.1	3		2	
Long-tailed tit (LT) *Aegithalos caudatus*			2	4	
Chiffchaff (CC) *Phylloscopus collybita*		5	4		
Willow warbler (WW) *Phylloscopus trochilus*	Amber	1			
Blackcap (BC) *Sylvia atricapilla*		2			

Species (and BTO species code)	RSPB listed	North site			Notes
		Est. no. pairs	Passage max.	Winter max.	
Whitethroat (WH) *Curruca communis*	Amber	1			
Reed warbler (RW) *Acrocephalus scirpeus*		1+			In reedbeds.
Goldcrest (GC) *Regulus regulus*				1	
Wren (WR) *Troglodytes troglodytes*	Amber	4		3	
Starling (SG) *Sturnus vulgaris*	Red		150	1000	
Blackbird (B.) *Turdus merula*		5		13	
Song thrush (ST) *Turdus philomelos*	Amber	1		15	
Redwing (RE) *Turdus iliacus*	Sch.1			24	
Fieldfare (FF) *Turdus pilaris*	Sch.1			6	
Mistle thrush (M.) *Turdus viscivorus*	Red			1	
Robin (R.) *Erithacus rubecula*		6		11	
Stonechat (SC) *Saxicola rubicola*				1	
Whinchat (WC) *Saxicola rubetra*	Red		1		
Wheatear (W.) *Oenanthe oenanthe*	Amber		1		
Dunnock (D.) *Prunella modularis*	Amber	3		5	
Pied wagtail (PW) *Motacilla alba*			8	1	
Meadow pipit (MP) *Anthus pratensis*	Amber	1	6	1	
Chaffinch (CH) *Fringilla coelebs*				29	
Bullfinch (BF) *Pyrrhula pyrrhula*	Amber	1		3	
Greenfinch (GR) *Chloris chloris*	Red	2	6	2	
Linnet (LI) *Linaria cannabina*	Red	1	36	70	
Lesser redpoll (LR) *Acanthis cabaret*	Red		1		
Goldfinch (GO) *Carduelis carduelis*		3	43	2	
Siskin (SK) *Spinus spinus*			2		
Corn bunting (CB) *Emberiza calandra*	Red		1		One in May.
Reed bunting (RB) *E. schoeniclus*	Amber	1	4	2	

4.4 Evaluation

4.4.1 The surveys revealed very large numbers of birds using the Dee Estuary, with hundreds or indeed thousands of Canada Goose, Pink-footed Goose, Shelduck, Wigeon, Mallard, Teal, Oystercatcher, Lapwing, Black-tailed Godwit, Dunlin, Redshank and Black-headed Gull

recorded (and much greater numbers of many of these species beyond the limit of the survey area).

4.4.2 At low tide birds are spread out throughout all areas of intertidal mud, saltmarsh and grazing marsh. As the tide rises, it pushes the birds from the lower reaches towards the higher areas, where they can rest at sites known as 'high tide roosts'. This means large numbers of birds were observed moving downriver (east to west) past the site on the rising tide to roost in the grazing marsh further north-west or even further afield, notably on the highest tides.

4.4.3 Good numbers of birds also use the large pond within the nature reserve (including its island and shores), including hundreds (or thousands) of Canada Goose, Mallard, Teal, Pintail and Black-tailed Godwit, with numbers augmented at high tide by birds arriving from the estuary. Being freshwater, the lake attracts a variety of species that do not frequent the estuary, including Shoveler, Gadwall, Tufted Duck, Moorhen, Coot, Little Grebe and a range of migrant wader species.

4.4.4 Only relatively small numbers of birds from the estuary were recorded within grassland areas, with up to 170 Lapwing, 42 Curlew, 15 Black-tailed Godwit and a single Whimbrel.

Annex 1 Species

4.4.5 With no records of Little Tern or Sandwich Tern, only two of the four species listed in the SPA citation were recorded during the surveys. Single Bar-tailed Godwits were recorded amongst Black-tailed Godwits on the larger water body within the nature reserve in May and July, and two were recorded on the adjacent grazing marsh in February. Low numbers of Common Terns were observed flying up and downriver during the spring and summer. None of these Annex 1 species make use of the site itself.

Qualifying Migrant species

4.4.6 Of the ten species listed, seven were recorded in the estuary in significant numbers: Redshank, Shelduck, Teal, Pintail, Oystercatcher, Dunlin and Black-tailed Godwit. The remaining three species were recorded only in relatively small numbers: Curlew, Knot and Grey Plover. All of these species were typically spread throughout the estuary, and only three were recorded within the nature reserve in significant numbers, all during the autumn: Teal, Pintail and Black-tailed Godwit. None of these species make use of the site itself.

Nature Reserve

4.4.7 The largest pond within the nature reserve was found to support significant numbers of birds, including Teal, Black-tailed Godwit and, less regularly, Pintail (all recorded in the autumn), all of which are SPA/Ramsar qualifying species.

4.4.8 Low numbers of Curlew (up to 42) and Black-tailed Godwit (15) were present in the nature reserve and adjacent fields along with up to 170 Lapwing and a single Whimbrel.

Breeding Birds

4.4.9 [redacted]

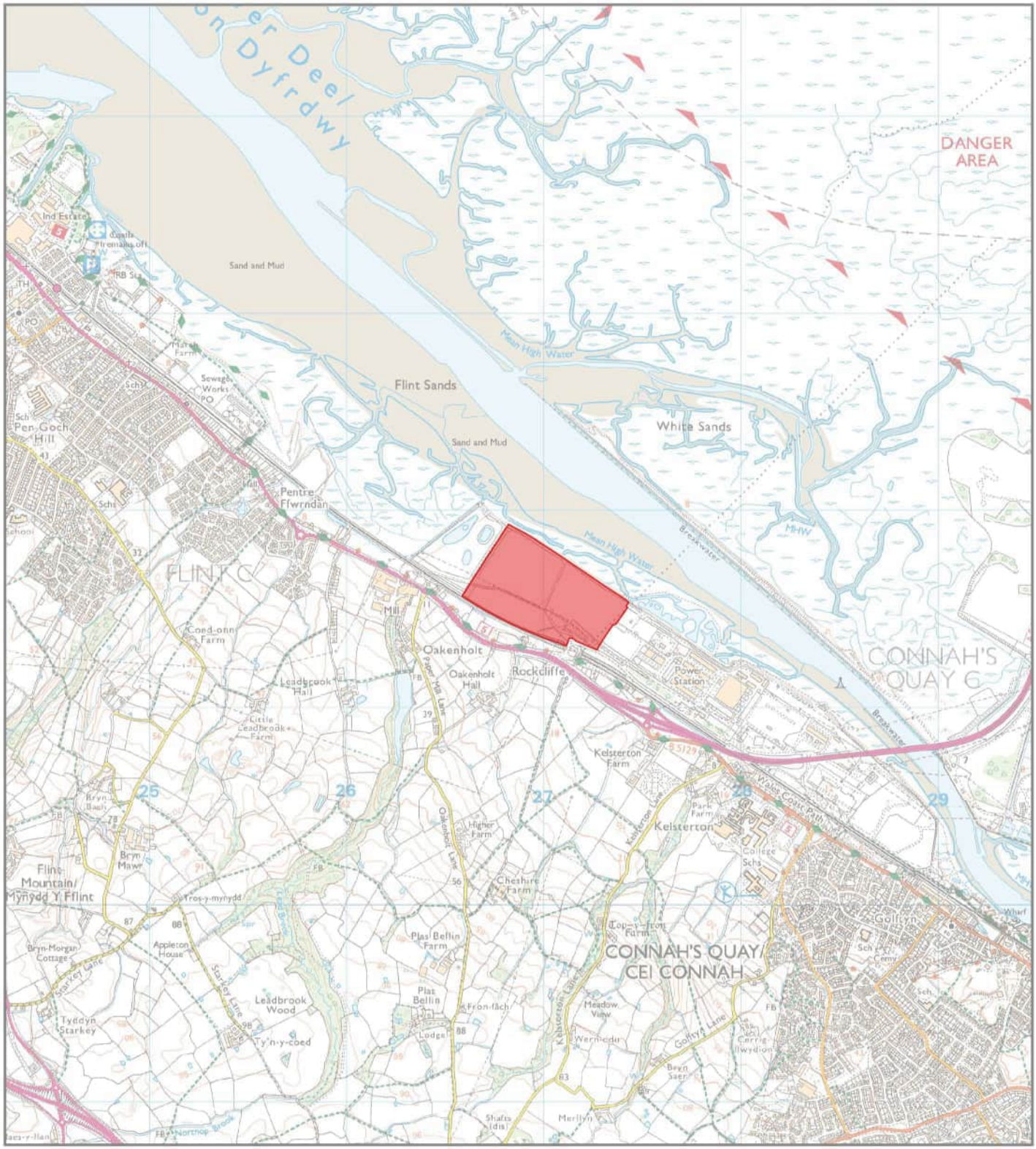
4.4.10 Cetti's Warbler was also recorded breeding within in the nature reserve. This is a Schedule 1 species, but is much more common and widespread.

4.4.11 Other wetland breeding species were generally more common in the nature reserve, including Tufted Duck, Moorhen, Coot, Reed Warbler, Reed Bunting and possibly Little Grebe.

4.4.12 Species breeding in terrestrial habitats within the site included Wood Pigeon, Willow Warbler, Whitethroat, Wren, Song Thrush, Dunnock, Meadow Pipit, Bullfinch, Greenfinch and Linnet. All these species are included in the RSPB Red or Amber List having undergone major or moderate declines in their UK populations over 25 years. Nevertheless, they all remain common and widespread in both a local and national context, as are all remaining species breeding within the site.

Plan 6322/ECO1:

Site Location



Key:

Site Location

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Connah's Quay (North)	PROJECT
Site Location	TITLE
6322/ECO1	DRAWING NO.
B/JP	REV
September 2023	DATE

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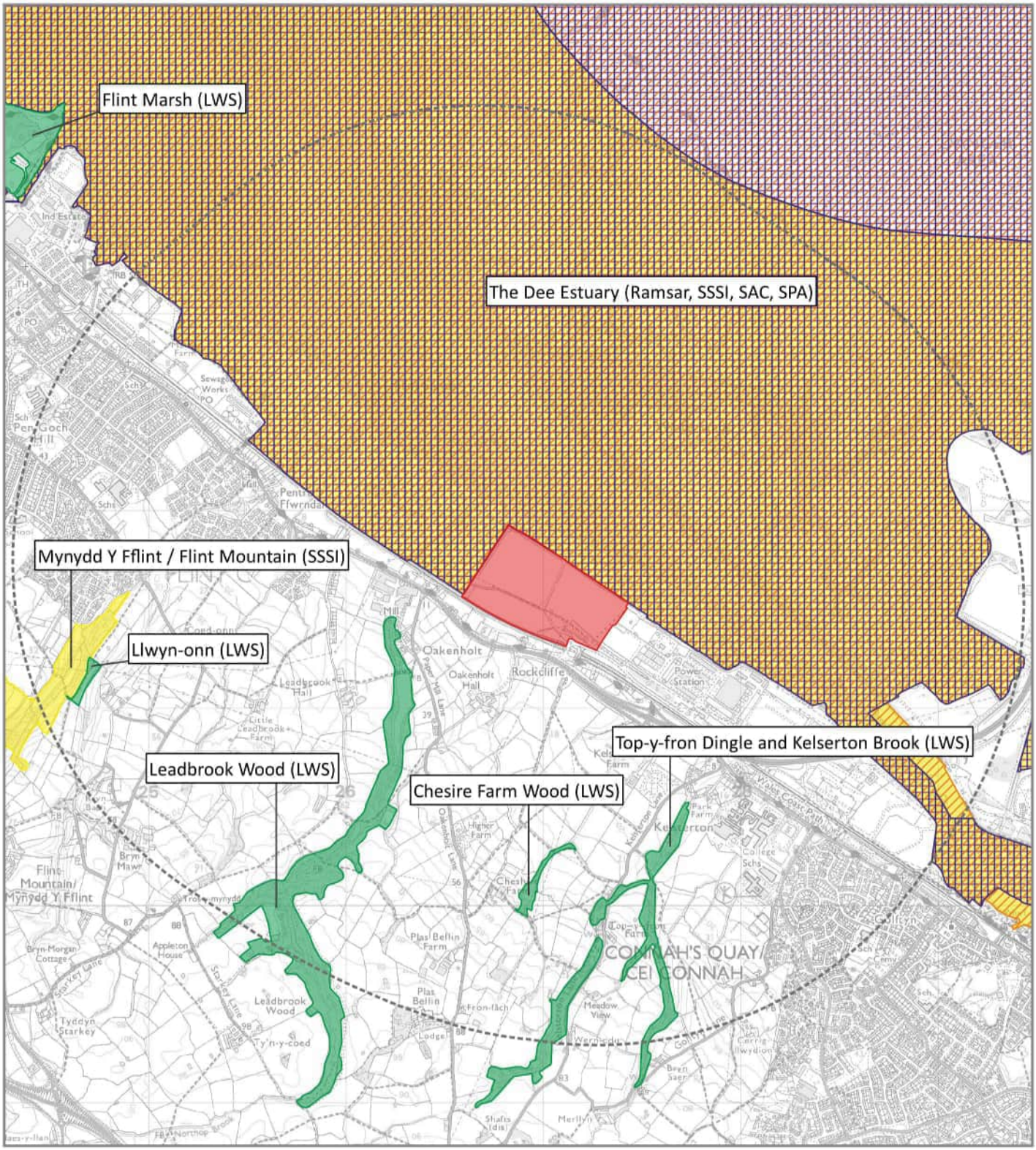
Plan 6322/ECO2:

Ecological Designations



Key:

- Site Location
- 2km Study Area
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Local Wildlife Site (LWS)

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Connah's Quay (North)	PROJECT
Ecological Designations	TITLE
6322/ECO2	DRAWING NO.
B/JP	REV
September 2023	DATE

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Plan 6322/ECO5:

Wintering and Passage Bird Surveys

Key:

Site Boundary

Survey Area

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Connah's Quay (North)	PROJECT
Extent of Wintering and Passage Bird Surveys	TITLE
6322/ECO5	DRAWING NO.
B/JP	REV
September 2023	DATE

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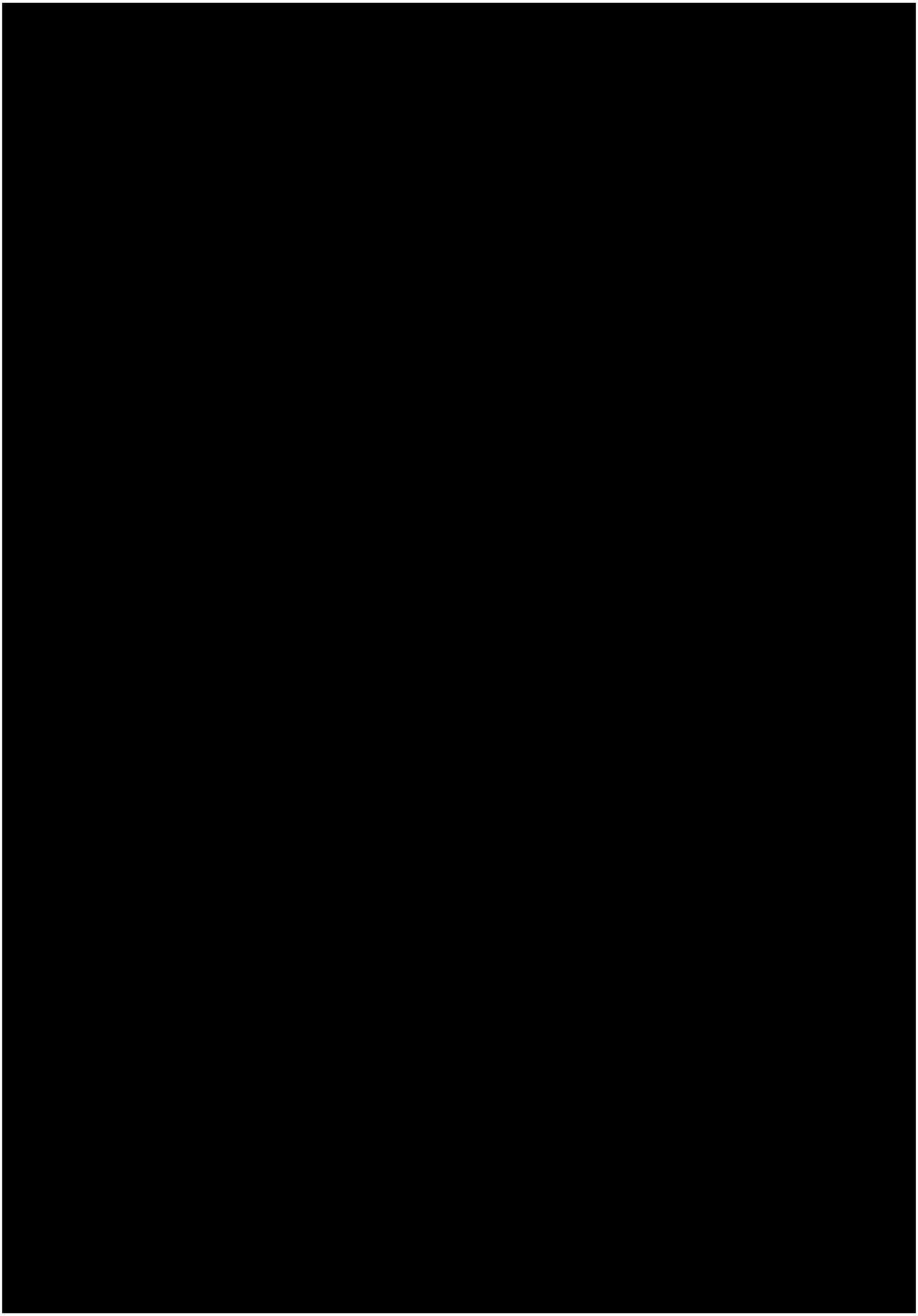
Plan 6322/ECO6:

Breeding Bird Surveys

[redacted]

Photographs



Appendix 6322/1:

Desk Study Data

EC Directive 79/409 on the Conservation of Wild Birds: Citation for Special Protection Area (SPA)

Name: The Dee Estuary

Unitary Authority/County: Cheshire West and Chester, Denbighshire, Flintshire, Wirral.

Boundary of the SPA: The Dee Estuary SPA encompasses the Dee Estuary/Aber Afon Dyfrdwy Site of Special Scientific Interest (SSSI); the dunes and intertidal foreshore at Gronant Dunes and Talacre Warren SSSI; the freshwater marsh at Inner Marsh Farm SSSI; and the lagoons and reedbeds at Shotton Lagoons and Reedbeds. The boundary of the SPA is shown on the map enclosed.

Site description: The Dee Estuary lies on the border between England and Wales on the north-west coast of Britain. It is a large, funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. Where agricultural reclamation has not occurred, the saltmarshes grade into transitional brackish and swamp vegetation on the upper shore. The site also includes the three sandstone islands of Hilbre, with their important cliff vegetation and maritime heathland and grassland. The two shorelines of the estuary show a marked contrast between the industrialised usage of the coastal belt in Wales and residential and recreational usage in England. The site is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders; in summer the site supports nationally important breeding colonies of two species of tern. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for Sandwich terns post-breeding.

Size of SPA: 14,291.56 ha.

European ornithological interest of SPA:

Qualifying species:
The site qualifies under **Article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex I species	Count and Season	Period	% of GB population
Bar-tailed Godwit *Limosa lapponica*	1,150 individuals - wintering	5 year peak mean 1994/95 - 1998/99	2.2%
Common Tern *Sterna hirundo*	392 pairs - breeding	5 year mean 1995 – 1999	3.2%
Little Tern *Sterna albifrons*	69 pairs – breeding	5 year mean 1995 - 1999	2.9%
Sandwich Tern *Sterna sandvicensis*	957 individuals- autumn passage	5 year mean 1995 - 1999	2.3%

The site qualifies under **Article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	**Count and Season**	**Period**	**% of population**
Redshank *Tringa totanus*	8,795 individuals - passage	5 year mean 1994/95 – 1998/99	5.9% Eastern Atlantic (wintering)
Shelduck *Tadorna tadorna*	7,725 individuals - wintering	5 year mean 1994/95 - 1998/99	2.6% Northwestern Europe
Teal *Anas crecca*	5,251 individuals - wintering	5 year mean 1994/95 - 1998/99	1.3% Northwestern Europe
Pintail *Anas acuta*	5,407 individuals - wintering	5 year mean 1994/95 - 1998/99	9.0% Northwestern Europe
Oystercatcher *Haematopus ostralegus*	22,677 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Europe & N/W Africa (wintering)
Grey Plover *Pluvialis squatarola*	1,643 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Eastern Atlantic (wintering)
Knot *Calidris canutus islandica*	12,394 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% NE Can/Grl/ Iceland/NW Eur
Dunlin *Calidris alpina*	27,769 individuals - wintering	5 year mean 1994/95 - 1998/99	2.0% N Siberia/Europe/ W Africa
Black-tailed Godwit *Limosa limosa islandica*	1,747 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Iceland (breeding)
Curlew *Numenius arquata*	3,899 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Europe (breeding)
Redshank *Tringa totanus*	5,293 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% Eastern Atlantic (wintering)

Assemblage qualification
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 120,726 individual waterbirds (5 year peak mean 1994/95 - 1998/99), including: Great Crested Grebe *Podiceps cristatus*, Cormorant *Phalacrocorax carbo*, Shelduck *Tadorna tadorna*, Wigeon *Anas penelope*, Teal *Anas crecca*, Pintail *Anas acuta*, Oystercatcher *Haematopus ostralegus*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*, Sanderling *Calidris alba*, Dunlin *Calidris alpina*, Black-tailed Godwit *Limosa limosa islandica*, Bar-tailed Godwit *Limosa lapponica*, Curlew *Numenius arquata* and Redshank *Tringa totanus*.

Non-qualifying species of interest: Leach's Petrel *Oceanodroma leucorhoa*, Little Egret *Egretta garzetta*, Bewick's Swan *Cygnus columbianus bewickii*, Whooper Swan *Cygnus cygnus*, Smew *Mergellus albellus*, Hen Harrier *Circus cyaneus*, Merlin *Falco columbarius*, Peregrine *Falco peregrinus*, Golden Plover *Pluvialis apricaria*, Ruff *Philomachus pugnax*, Wood Sandpiper *Tringa glareola*, Short-eared Owl *Asio flammeus* and Kingfisher *Alcedo atthis* (all Annex 1 species) occur in non-breeding numbers of less than European importance (less than 1% of the GB population).

Status of SPA:
The Dee Estuary was first classified as a Special Protection Area on 17 July 1985. The boundaries and site features were revised on 10 December 2009.

European Site Conservation Objectives for The Dee Estuary Special Protection Area Site Code: UK9013011

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying Conservation Advice document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
A052 *Anas crecca*; Eurasian teal (Non-breeding)
A054 *Anas acuta*; Northern pintail (Non-breeding)
A130 *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A160 *Numenius arquata*; Eurasian curlew (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding)
A193 *Sterna hirundo*; Common tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage

This is a cross border site

This site crosses the border between England and Wales. Some features may only occur in one Country. The advice of Natural Resources Wales should therefore be sought separately.

This is a European Marine Site

This SPA is a part of the Dee Estuary European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS.

Natural England's formal Conservation Advice for European Marine Sites can be found via GOV.UK.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 4). This document updates and replaces an earlier version dated 5 February 2016 to reflect the consolidation of the Habitats Regulations in 2017.

Special Areas of Conservation

Dee Estuary/ Aber Dyfrdwy

Designated Special Area of Conservation (SAC)

Country	England/Wales
Unitary Authority	Cheshire, East Wales, Extra-Regio, Merseyside, West Wales and The Valleys
Centroid*	SJ191819
Latitude	53.32833333
Longitude	-3.216111111
SAC EU Code	UK0030131
Status	Designated Special Area of Conservation (SAC)
Area (ha)	15805.27

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

Location of Dee Estuary/ Aber Dyfrdwy SAC

General site character

- Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins) (81.8%)
- Salt marshes, Salt pastures, Salt steppes (16.1%)
- Coastal sand dunes, Sand beaches, Machair (0.7%)
- Shingle, Sea cliffs, Islets (0.5%)
- Bogs, Marshes, Water fringed vegetation, Fens (0.4%)
- Humid grassland, Mesophile grassland (0.2%)
- Improved grassland (0.1%)
- Broad-leaved deciduous woodland (0.1%)
- Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (0.1%)

Download the Standard Data Form for this site as submitted to Europe (PDF <100kb)

Note When undertaking an appropriate assessment of impacts at a site, all features of European importance (both primary and non-primary) need to be considered.

Annex I habitats that are a primary reason for selection of this site

- **1140 Mudflats and sandflats not covered by seawater at low tide**
  Species occurrence description not yet available.

- **1310 Salicornia and other annuals colonizing mud and sand**

  The Dee Estuary is representative of pioneer glasswort *Salicornia* spp. saltmarsh in the north-west of the UK. *Salicornia* spp. saltmarsh forms extensive stands in the Dee, especially on the more sandy muds where there is reduced tidal scour. It mainly occurs on the seaward fringes as a pioneer community, and moving landwards usually forms a transition to common saltmarsh-grass *Puccinellia maritima* saltmarsh (SM10). There is also a low frequency of *Salicornia* spp. extending well inland. Associated species often include annual sea-blite *Suaeda maritima* and hybrid scurvy grass *Cochlearia x hollandica*.

- **1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
  The Dee Estuary is representative of **H1330 Atlantic salt meadows** in the north-west of the UK. It forms the most extensive type of saltmarsh in the Dee, and since the 1980s it has probably displaced very large quantities of the non-native common cord-grass *Spartina anglica*. The high accretion rates found in the estuary are likely to favour further development of this type of vegetation. The saltmarsh is regularly inundated by the sea; characteristic salt-tolerant perennial flowering plant species include common saltmarsh-grass *Puccinellia maritima*, sea aster *Aster tripolium*, and sea arrowgrass *Triglochin maritima*. In a few areas there are unusual transitions to wet woodland habitats.

Annex I habitats present as a qualifying feature, but not a primary reason for

selection of this site

- **1130 Estuaries**
- **1210 Annual vegetation of drift lines**
- **1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts**
- **2110 Embryonic shifting dunes**
- **2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"**
- **2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" * Priority feature**
- **2190 Humid dune slacks**

Annex II species that are a primary reason for selection of this site

- Not Applicable

Annex II species present as a qualifying feature, but not a primary reason for site selection

- **1095 Sea lamprey** *Petromyzon marinus*
- **1099 River lamprey** *Lampetra fluviatilis*
- **1395 Petalwort** *Petalophyllum ralfsii*

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

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CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

FLINTSHIRE **MYNYDD Y FFLINT/FLINT MOUNTAIN**

Date of Notification: 19 May 2011

National Grid Reference: SJ 243709

OS Maps: 1:50,000 Sheet number: 116
1:10,000 Sheet number: SJ27SW

Site Area: 25.79ha

Description

The site is of special interest for its stands of unimproved neutral grassland and semi-natural broadleaved woodland, which occur in association with scrub, fen-meadow and swamp vegetation. Mynydd y Fflint/Flint Mountain SSSI is located 1km to the south of Flint, north of the village of Flint Mountain, at an altitude ranging from 35 - 70m.

The site follows the course of a brook within a valley with gentle slopes extending on either side. The slopes are free draining, with the underlying geology consisting of mudstones of the Upper Carboniferous Period, which are overlain by mostly till with some glacial sands and gravels.

The neutral grassland areas on the drier slopes are of high floristic quality and hold a range of grasses, including red fescue *Festuca rubra*, sweet vernal-grass *Anthoxanthum odoratum*, common bent *Agrostis capillaris*, Yorkshire fog *Holcus lanatus*, and crested dog's-tail *Cynosurus cristatus*. Herbs are prominent, with frequent to abundant common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata* and red clover *Trifolium pratense*, and frequent field woodrush *Luzula campestris* and bulbous buttercup *Ranunculus bulbosus*. Some notable plants include pale flax *Linum bienne* and an inland population of rest harrow *Ononis repens*.

Alder *Alnus glutinosa* with grey willow *Salix cinerea* dominates the large areas of semi-natural broadleaved woodland found mainly along the valley bottom. The ground flora varies greatly with areas dominated by great horsetail *Equisetum telmateia* with extensive beds of lesser pond sedge *Carex acutiformis* with scattered marsh willowherb *Epilobium palustre*; whilst other areas have frequent ivy *Hedera helix* with bramble *Rubus fruticosus* and yellow archangel *Lamiastrum galeobdolon*.

In places the vegetation grades into swamp dominated by lesser pond sedge *Carex acutiformis*, with scattering of associates such as water mint *Mentha aquatica*, great willowherb *Epilobium hirsutum*, marsh horsetail *Equisetum palustre*, and marsh marigold *Caltha palustris*. This in turn gives way to areas of rich mixed fen with the addition of the locally uncommon greater tussock sedge *Carex paniculata* and sneezwort *Achillea ptarmica*. Some notable associated species in this vegetation included figwort *Scrophularia nodosa*, and hemp agrimony *Eupatorium*

cannabinum.

The transition between the vegetation communities is well developed with small areas of fen-meadow dominated by the locally uncommon blunt flowered rush *Juncus subnodulosus* accompanied by fen bedstraw *Galium uliginosum*, angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria*, marsh valerian *Valeriana dioica* and marsh thistle *Cirsium palustr*e. Mynydd y Fflint/Flint Mountain is only the second known site for this fen-meadow community in the North East Wales.

The site also supports a variety of other semi-natural vegetation types including areas bracken, scrub and other broadleaved woodland communities.

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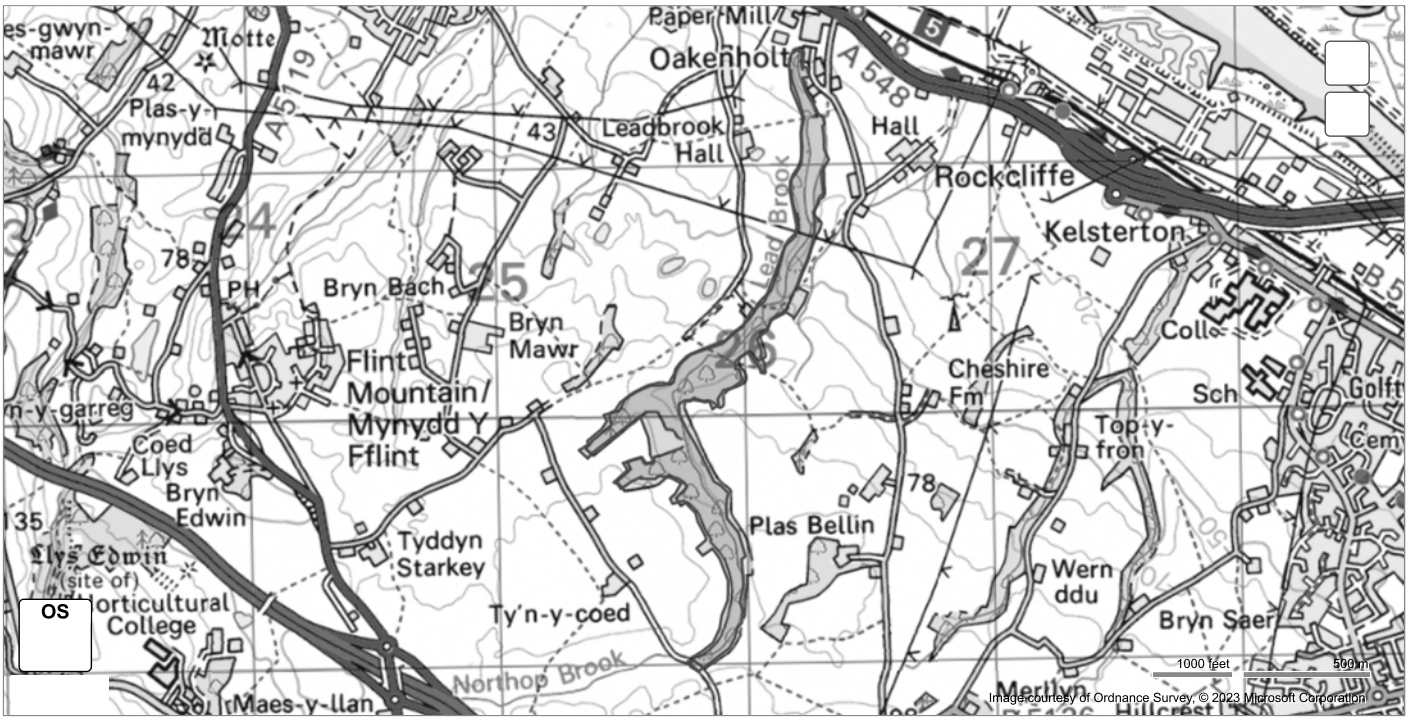
Safleol

A Local Sites System for Wales

26NE10: Leadbrook Wood

Location:	Flintshire
Centroid Grid Reference:	SJ259701
Area:	35.1 ha
Site Description:	Semi-natural broad-leaved woodland occupying the dingles in which the Lead Brook and its tributaries flow. In several areas drainage is impeded. The woodland canopy is mainly dominated by ash and sycamore with some oak alder, beech, common lime and silver birch. The shrub layer has abundant holly, hazel and wych elm. Also present are hawthorn and grey willow. The ground flora has frequent dog's mercury, bramble, wood anemone, enchanter's nightshade, bluebell, opposite-leaved golden saxifrage and wood speedwell. In wet areas of the southern part of the wood, marsh marigold, giant horsetail and meadowsweet are prominent. The northern tip of the woodland is mixed. In the north, the woodland surrounds a reservoir and alder and oak are dominant with hemlock water-dropwort, yellow flag and figwort. Near Ty'n-y-coed there is a semi-improved and a species-rich marshy grassland, with oval sedge, ragged robin, common spotted orchid, sharp-flowered rush, cuckoo flower, carnation sedge and meadowsweet. On the slope above this is a herb-rich meadow with pignut, black knapweed, cat's-ear, crested dog's tail and sweet vernal grass.
Habitats:	Broad-leaved semi-natural woodland (30.241 ha), Mixed plantation (1.57 ha), Semi-improved neutral grassland (0.721 ha), Marsh/marshy grassland (0.438 ha), Swamp (0.278 ha), Standing water (1.945 ha)
Designation Reason:	Broad-leaved woodland and scrub, Pasture/meadow and scrub

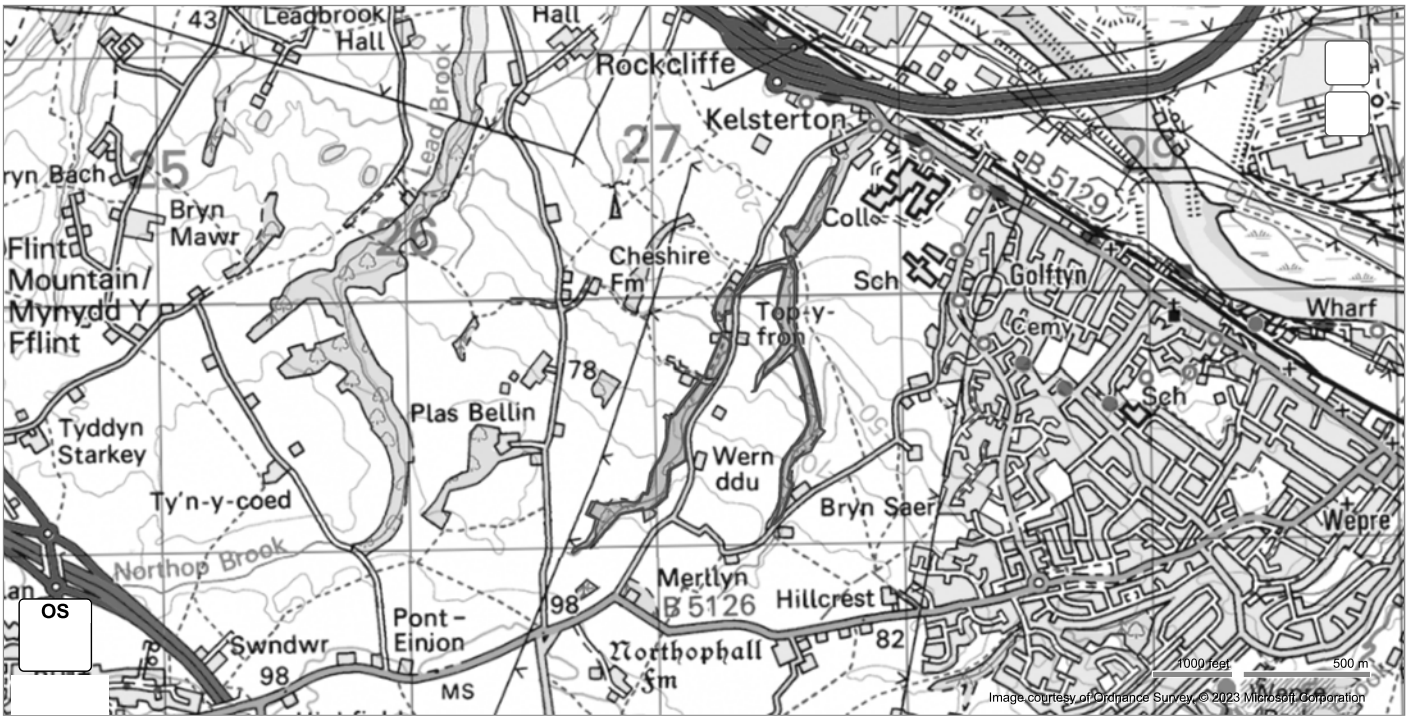


Safleol

A Local Sites System for Wales

26NE09: Top-y-fron Dingle and Kelserton Brook

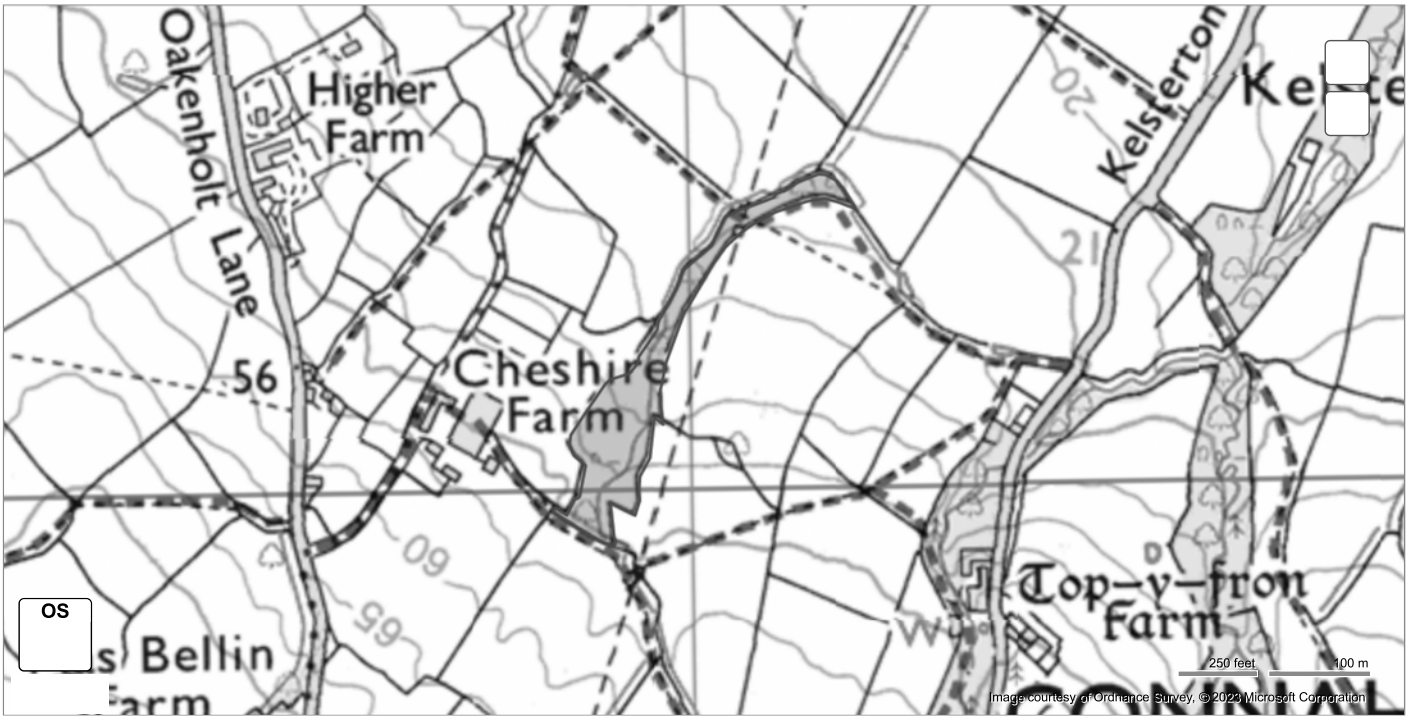
Location:	Flintshire
Centroid Grid Reference:	SJ273696
Area:	16.4 ha
Site Description:	Semi-natural broad-leaved woodland occupying two narrow steep-sided steam valleys that join into one south of Kelsterton. The dominant woodland canopy species is sycamore, but sessile oak, alder, ash and birch are all locally dominant. The Kelsterton Brook section also has common lime and yew. The shrub layer is variable. Top-y-Fron Dingle has a shrub layer of holly, hazel, elder and canopy saplings. The northern section of Kelsterton Brook lacks a shrub layer and the southern section has abundant elder but rhododendron and other introduced species are locally dominant. There is a rich herb flora. In Top-y-Fron Dingle bramble, ramsons, opposite-leaved golden saxifrage, dog's mercury, wood sorrel and bryophytes are all frequent. The herb layer in the Kelsterton Dingle has frequent wood speedwell, dog's mercury, red campion with some nettle, bramble, bluebell, ramsons and rough meadow-grass. The northern part is dominated by rough meadow-grass.
Habitats:	Broad-leaved semi-natural woodland (16.335 ha)
Designation Reason:	Broad-leaved woodland and scrub



Safleol
A Local Sites System for Wales

27SE01: Cheshire Farm Wood

Location:	Flintshire
Centroid Grid Reference:	SJ269701
Area:	1.6 ha
Site Description:	Semi-natural broad-leaved woodland following the course of a small stream. The woodland canopy is dominated by sessile oak with some beech, sycamore and ash. The shrub layer contains wych elm, hawthorn, hazel and beech. The ground flora has abundant wood melick, soft grass and bluebell with pignut, wood anemone, wood speedwell, bramble and greater stitchwort.
Habitats:	Broad-leaved semi-natural woodland (1.617 ha)
Designation Reason:	Broad-leaved woodland and scrub



Appendix 6322/2:

Evaluation Methodology

Evaluation Methodology

1. The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[1].

Importance of Ecological Features

2. Ecological features within the site/study area have been evaluated in terms of whether they qualify as 'important ecological features'. In this regard, CIEEM guidance states that *"it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable".*

3. Various characteristics contribute to the importance of ecological features, including:

- Naturalness;
- Animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- Ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity;
- Habitat connectivity and/or synergistic associations;
- Habitats and species in decline;
- Rich assemblages of plants and animals;
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

4. As an objective starting point for identifying important ecological features, European, national and local governments have identified sites, habitats and species which form a key focus for biodiversity conservation in the UK, supported by policy and legislation. These are summarised by CIEEM guidance as follows:

Designated Sites

- Statutory sites designated or classified under international conventions or European legislation, for example World Heritage Sites, Biosphere Reserves, Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA);

[1] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*', Chartered Institute of Ecology and Environmental Management, Winchester

- Statutory sites designated under national legislation, for example Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
- Locally designated wildlife sites, e.g. Local Wildlife Sites (LWS).

Biodiversity Lists

- Habitats and species of principal importance for the conservation of biodiversity in England and Wales (largely drawn from UK BAP priority habitats and priority species), often referred to simply as Priority Habitats / Species;
- Local BAP priority species and habitats.

Red Listed, Rare, Legally Protected Species

- Species of conservation concern, Red Data Book (RDB) species;
- Birds of Conservation Concern;
- Nationally rare and nationally scarce species;
- Legally protected species.

5. In addition to this list, other features may be considered to be of importance on the basis of local rarity, where they enable effective conservation of other important features, or play a key functional role in the landscape.

<u>Assigning Level of Importance</u>

6. The importance of an ecological feature should then be considered within a defined geographical context. Based on CIEEM guidance, the following frame of reference is used:

- International (European);
- National;
- Regional;
- County;
- District;
- Local (e.g. Parish or Neighbourhood);
- Site (not of importance beyond the immediate context of the site).

7. Features of 'local' importance are those considered to be below a district level of importance, but are considered to appreciably enrich the nature conservation resource or are of elevated importance beyond the context of the site.

8. Where features are identified as 'important' based on the list of key sites, habitats and species set out above, but are very limited in extent or quality (in terms of habitat resource or species population) and do not appreciably contribute to the biodiversity interest beyond the context of the site, they are considered to be of 'site' importance.

9. In terms of assigning the level of importance, the following considerations are relevant:

Designated Sites

10. For designated sites, importance should reflect the geographical context of the designation (e.g. SAC/SPA/Ramsar sites are designated at the international level whereas SSSIs are designated at the national level). Consideration should be given to multiple designations as appropriate (where an area is subject to differing levels of nature conservation designations).

Habitats

11. In certain cases, the value of a habitat can be measured against known selection criteria, e.g. SAC selection criteria, 'Guidelines for the selection of biological SSSIs' and the Hedgerows Regulations 1997. However, for the majority of commonly encountered sites, the most relevant habitat evaluation will be at a more localised level and based on relevant factors such as antiquity, size, species-diversity, potential, naturalness, rarity, fragility and typicalness (Ratcliffe, 1977). The ability to restore or re-create the habitat is also an important consideration, for example in the case of ancient woodland.

12. Whether habitats are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Habitats of Principal Importance' or 'Priority Habitats', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular habitat under a BAP does not in itself imply any specific level of importance.

13. Habitat inventories (such as habitat mapping on the MAGIC database) or information relating to the status of particular habitats within a district, county or region can also assist in determining the appropriate scale at which a habitat is of importance.

Species

14. Deciding the importance of species populations should make use of existing criteria where available. For example, there are established criteria for defining nationally and internationally important populations of waterfowl. The scale within which importance is determined could also relate to a particular population, e.g. the breeding population of common toads within a suite of ponds or an otter population within a catchment.

15. When determining the importance of a species population, contextual information about distribution and abundance is fundamental, including trends based on historical records. For example, a species could be considered particularly important if it is rare and its population is in decline. With respect to rarity, this can apply across the geographic frame of reference and particular regard is given to populations where the UK holds a large or significant proportion of the international population of a species.

16. Whether species are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Species of Principal Importance' or 'Priority Species', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular species under a BAP does not in itself imply any specific level of importance.

17. Species populations should also be considered in terms of the potential zone of influence of the proposals, i.e. if the entire species population within the site and surrounding area were to be affected by the proposed development, would this be of significance at a local, district, county or wider scale? This should also consider the foraging and territory ranges of individual species (e.g. bats roosting some distance from site may forage within site whereas other species such as invertebrates may be more sedentary).

Appendix 6322/3:

Legislation Summary

LEGISLATION SUMMARY

1. In England and Wales primary legislation is made by the UK Parliament, and in Scotland by the Scottish Parliament, in the form of Acts. The main piece of legislation relating to nature conservation in the UK is the Wildlife and Countryside Act 1981 (as amended).

2. Acts of Parliament confer powers on Ministers to make more detailed orders, rules or regulations by means of secondary legislation in the form of statutory instruments. Statutory instruments are used to provide the necessary detail that would be too complex to include in an Act itself[1]. The provisions of an Act of Parliament can also be enforced, amended or updated by secondary legislation.

3. In summary, the key pieces of legislation relating to nature conservation in the UK are:

    - Wildlife and Countryside Act 1981 (as amended)
    - Protection of Badgers Act 1992
    - Hedgerows Regulations 1997
    - Countryside and Rights of Way (CRoW) Act for England and Wales 2000
    - Natural Environment and Rural Communities Act 2006
    - Conservation of Habitats and Species Regulations 2017

4. A brief summary of the relevant legislation is provided below. The original Acts and instruments should be referred to for the full and most up to date text of the legislation.

5. **Wildlife and Countryside Act 1981 (as amended)**. The WCA Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) identified for their flora, fauna, geological or physiographical features. The Act contains strict measures for the protection and management of SSSIs.

6. The Act also refers to the treatment of UK wildlife including protected species listed under Schedules 1 (birds), 5 (mammals, herpetofauna, fish, invertebrates) and 8 (plants).

7. Under Section 1(1) of the Act, all wild birds are protected such that is an offence to intentionally:

    - Kill, injure or take any wild bird;
    - Take, damage or destroy the nest of any wild bird whilst in use* or being built;
    - Take or destroy an egg of any wild bird.

    * The nests of birds that re-use their nests as listed under Schedule ZA1, e.g. Golden Eagle, are protected against taking, damage or destruction irrespective of whether they are in use or not.

8. Offences in respect of Schedule 1 birds are subject to special, i.e. higher, penalties. Schedule 1 birds also receive greater protection such that it is an offence to intentionally or recklessly:

    - Disturb any wild bird included in Schedule 1 while it is building a nest or while it is in, on or near a nest containing eggs or young;
    - Disturb dependent young of such a bird.

[1] http://www.parliament.uk/business/bills-and-legislation/secondary-legislation/statutory-instruments/

9. Under Section 9(1) of the Act, it is an offence to:

- Intentionally kill, injure or take any wild animal included in Schedule 5.

10. In addition, under Section 9(4) it is an offence to intentionally or recklessly:

- Obstruct access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection; or
- Disturb any wild animal included in Schedule 5 while occupying a structure or place which it uses for that purpose.

11. Under Section 13(1) it is an offence:

- To intentionally pick, uproot or destroy any wild plant listed in Schedule 8; or
- Unless the authorised person, to intentionally uproot any wild plant not included in Schedule 8.

12. The Act also contains measures (S.14) for preventing the establishment of non-native species that may be detrimental to native wildlife, prohibiting the introduction into the wild of animals (releases or allows to escape) and plants (plants or causes to grow) listed under Schedule 9.

13. **Protection of Badgers Act 1992.** The Act aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. It should be noted that the legislation is not intended to prevent properly authorised development. Under the Act it is an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat* a Badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett# (this includes disturbing Badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

* the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence

\# A sett is defined as "*any structure or place which displays signs indicating current use by a Badger*". Natural England advice (June 2009) is that a sett is protected so long as such signs remain present, which in practice could potentially be for some time after the last actual occupation by Badger. Interference with a sett includes blocking tunnels or damaging the sett in any way

14. Licences can be obtained from the Statutory Nature Conservation Organisation (SNCO) for development activities that would otherwise be unlawful under the legislation, provided there is suitable justification. The SNCO for England is Natural England.

15. **Hedgerows Regulations 1997**. 'Important' hedgerows (as defined by the Regulations) are protected from removal (up-rooting or otherwise destroying). Various criteria specified in the Regulations are employed to identify 'important' hedgerows for wildlife, landscape or historical reasons.

16. **Countryside and Rights of Way (CRoW) Act for England and Wales 2000.** The CRoW Act provides increased measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation. Schedule 12 of the Act amends the species provisions of the WCA 1981, strengthening the legal protection for threatened species. The Act also introduced a duty on Government to have regard to the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

17. **Natural Environment and Rural Communities Act 2006.** Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as local planning authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when exercising their normal functions. 56 habitats and 943 species of principal importance are included on the S41 list. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan (BAP).

18. **Conservation of Habitats and Species Regulations 2017 (as amended).** The Regulations enact the European Union's Habitats Directive (92/43/EEC) in the UK. The Habitats Directive was designed to contribute to the maintenance of biodiversity within member states through the conservation of sites, known in the UK as Special Areas of Conservation (SACs), containing habitats and species selected as being of EC importance (as listed in Annexes I and II of the Habitats Directive respectively). Member states are required to take measures to maintain or restore these natural and semi-natural habitats and wild species at a favourable conservation status.

19. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs)[2] classified under Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). These sites constitute the Natura 2000 network. The Regulations impose restrictions on planning decisions likely to significantly affect SPAs or SACs.

20. The Regulations also provide protection to European Protected Species of animals that largely overlaps with the WCA 1981, albeit the provisions are generally stricter. Under Regulation 43 it is an offence, *inter alia*, to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species;
- Deliberately disturb any wild animals of any such species, including in particular any disturbance likely to impair their ability to survive, to breed or reproduce, to rear or nurture their young, to hibernate or migrate, or which is likely to affect significantly their local distribution or abundance;
- Deliberately take or destroy the eggs of such an animal;
- Damage or destroy a breeding site or resting place of such an animal.

21. Similar protection is afforded to European Protected Species of plants, as detailed under Regulation 47.

22. The Regulations do provide a licensing system that permits otherwise illegal activities in relation to European Protected Species, subject to certain tests being fulfilled.

[2] Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC) (aka the Birds Directive), which came into force in April 1979. SPAs are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.

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Connah's Quay Power Station:
Southern Land Parcel

Breeding, Passage and Wintering Bird Surveys

July 2023

Quality Management	
Client:	Uniper UK Ltd
Project:	Connah's Quay Power Station: Southern Land Parcel
Report Title:	Breeding, Passage and Wintering Bird Surveys
Project Number:	ECO-6322
File Reference:	6322 Birds South 2023 dv2 /ADB
Date:	10/07/2023

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Executive Summary

i) **Introduction**. Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake ecological surveys of the Southern Land Parcel at Connah's Quay Power Station, Connah's Quay, Flintshire.

ii) **Survey.** Breeding, wintering and passage bird surveys were undertaken at the site from April 2022 to February 2023.

iii) **Ecological Designations.** The site lies immediately adjacent to the statutory designation Dee Estuary (SPA, Ramsar and SAC). This is a vast site designated for its wintering and passage birds which extends substantially from the site's northern and eastern boundaries.

iv) **Habitats.** The site comprises areas of rough pasture, bare ground and scrub which provide suitable habitat for a range of breeding bird species. There are no habitats within the site that are suitable to support wetland bird species.

v) **Survey Findings.** None of the Annex 1 species relevant to the SPA/Ramsar site were recorded during surveys of the estuary adjacent to the site. Of the qualifying migratory species, Redshank was the only one recorded in the estuary in significant numbers. Shelduck, Teal, Oystercatcher, Curlew and Dunlin were present in relatively low numbers. All of these species were typically observed widespread within the estuary and none were recorded within the site, which is unsuitable to support wetland bird species.

The site itself supports no habitats suitable for wetland species. Even habitat for terrestrial species is limited, with breeding species including very low numbers of Woodpigeon, Wren, Dunnock, Greenfinch and possibly Willow Warbler, all Red or Amber List species that remain very common and widespread both locally and nationally.

In early 2023 the site was largely cleared of scrub and trees. As a result, very little suitable breeding bird habitat remains present within this area.

1 Introduction

1.1 Background and Proposals

1.1.1 Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake a desk study and baseline ecological surveys of the Southern Land Parcel at Connah's Quay Power Station, Connah's Quay, approximately centred at grid reference SJ 288 703 (see Plan 6322/ECO1), hereafter referred to as 'the site'.

1.1.2 Breeding, Wintering and Passage bird surveys were undertaken at the site from April 2022 to February 2023.

1.2 Site Overview

1.2.1 The site is located in north-east Flintshire in North Wales (see Plan 6322/ECO1). The site is bounded to the north and east by the River Dee. Connah's Quay Power Station is located immediately adjacent to the site's western boundary and a railway line defines the site's southern site boundary. The town of Connah's Quay extends to the south. The Deeside Industrial Park is present to the north and east across the River Dee.

1.2.2 The site itself comprises hard standing and disturbed land which has been recently cleared of scrub, grassland, and small patches of scrub and tall ruderal vegetation.

1.2.3 The site is located immediately south and east of the River Dee estuary where saltmarsh and grazing marsh extends to the north and west around industrial development within the River Dee Special Protection Area (SPA) and Ramsar site.

1.3 Purpose of the Report

1.3.1 This report documents the methods and findings of the desk study and surveys of breeding, passage and wintering birds undertaken. The importance of the habitats and bird species present is evaluated.

2 Methodology

2.1 Data Search

2.1.1 Background information relevant to the site and its immediate surroundings to a distance of 2km was sourced from the North Wales Environmental Information Service (Cofnod) in August 2021. The data obtained comprised information on designated sites and species records.

2.1.2 Information on statutory designations was obtained from the MAGIC database[1], which uses data provided by Natural England, from within an extended search area of 25km. The MAGIC database was also searched for the presence of Priority Habitats within or adjacent to the site. Relevant information is reproduced in Appendix 6322/1 and on Plan 6322/ECO2.

2.2 Bird Surveys

2.2.1 Monthly surveys were carried out from April 2022 until February 2023 in order to assess breeding bird activity (April to July), passage activity (April, May and July to November) and winter activity (November to February) at the site and adjacent areas. The times, tide state and weather conditions during all surveys are shown in Table 2.1 below.

Table 2.1. Tide and weather conditions during the bird surveys.

Survey Date	Time of Survey	Tide and Weather Conditions					
		High Tide (time, ht)	Tide State	Wind (direction, speed BF)	Temp (°C)	Cloud Cover (/8)	Rain
25/04/2022	05:00-09:00	07:28 (3.1m)	High	NE, 1	4	1/8	Dry
20/05/2022	09:30-15:20	15:16 (4.1m)	Rising/high	S, 2	15	7-8/8	Dry
12/06/2022	10:20-14:50	10:04 (4.1m)	High/Falling	SW, 3	16	6/8	Dry
25/07/2022	08:45-13:10	10:03 (3.1m)	High/Falling	SW, 3	16	8/8	Drizzle
15/08/2022	10:15-15:40	14:32 (4.5m)	Rising/high	SW, 1	18	8/8	Showers
06/09/2022	12:20-16:50	08:08 (3.0m)	Low	S, 3	21	3/8	Showers
10/10/2022	09:15-15:30	12:22 (4.7m)	High/Falling	NW, 4	13	4/8	Dry
07/11/2022	08:00-12:50	10:23 (4.4m)	High	SW, 3	12	8/8	Dry
15/12/2022	10:35-15:35	15:37 (3.2m)	Rising/high	N, 1	-2	0/8	Dry
24/01/2023	11:00-15:25	13:01 (5.1m)	High	No wind	2	8/8	Dry
21/02/2023	13:45-18:00	11:57 (5.2m)	Low	W, 3	10	6/8	Dry

BF = Beaufort Force: BF0 = calm, BF12 = hurricane force

2.2.2 On each survey an experienced ornithologist walked a circuitous route around the site boundary recording the locations, numbers and activity of all birds present in (and around) the areas during this time.

[1] Multi-Agency Geographic Information for the Countryside (MAGIC), https://magic.defra.gov.uk/

2.2.3 Surveys revealed large numbers of birds using the River Dee estuary, predominately at distance from the site. Therefore, in order to make the surveys manageable and relevant to the sites, counts were limited to an area extending into this area to approximately 500m from the site boundary as shown on Plan 6322/ECO5. This area did not include the far bank of the River Dee. Counts of birds on the estuary and River Dee were primarily made from a viewpoint south of the site.

2.2.4 This methodology ensures that the vast majority of species that use the site would have been recorded over the course of the surveys, although some species that may use the site as part of a larger territory may potentially be overlooked, particularly nocturnal species such as owls.

2.2.5 To determine the breeding status of birds using the site, the following criteria were applied following the methodology used in the 'Atlas' surveys of 1988-1991 (Gibbons et al, 1993). This method accepts the following activities as denoting breeding (including those probably breeding although definite proof was lacking):

- Bird apparently holding territory, including courtship and display;
- Nest-building (including excavating nest-hole);
- Distraction display or feigning injury;
- Adult carrying faecal sac or food;
- Adult entering or leaving apparently occupied nest site;
- Nest with eggs or eggshells found, or bird sitting but not disturbed; and
- Nest with young; or downy/recently fledged young.

2.2.6 In order to ensure that robust data relating to the site and the River Dee estuary was obtained, most surveys were timed to coincide with high tide (to enable observation of high tide roosts of species using the SPA/Ramsar site when feeding areas are covered by water). During the course of all surveys, all states of tide were surveyed.

2.3 Ecological Evaluation Methodology

2.3.1 The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018)[2], which involves identifying 'important ecological features' within a defined geographical context (i.e. international, national, regional, county, district, local or site importance). Further detail is provided in Appendix 6322/2.

2.4 National Policy Approach to Biodiversity in the Planning System

2.4.1 National Planning Policy in Wales is set out in Planning Policy Wales (PPW)[3]. This describes policies designed to maximise environmental protection and limit environmental impact

[2] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'*, ver. 1.1, Chartered Institute of Ecology and Environmental Management, Winchester

[3] Llywodraeth Cymru/Welsh Government (2021). *'Planning Policy Wales'*, Edition 11, February 2021.

including the promotion of resilient biodiversity and ecosystems, citing biodiversity as an element in the delivery of distinctive and natural places, and ensuring environmental sustainability through good design.

2.4.2 PPW sets out a framework for the sustainable management of natural resources, which within which the planning system contribute by:

'• improving the resilience of ecosystems and ecological networks;

• halting and reversing the loss of biodiversity;

• maintaining and enhancing green infrastructure based on seeking multiple ecosystem benefits and solutions;' amongst other measures.

2.4.3 PPW embeds the protection and enhancement of biodiversity within all components of the planning system in Wales, stating that:

'Biodiversity loss should be reversed, pollution reduced, environmental risks addressed and overall resilience of ecosystems improved.'

2.4.4 The approach to dealing with biodiversity in the context of planning applications is set out on Section 6.4, stating:

'The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.'

and

'Development plan strategies, policies and development proposals must consider the need to:

• support the conservation of biodiversity, in particular the conservation of wildlife and habitats;

• ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;

• ensure statutorily and non-statutorily designated sites are properly protected and managed;

• safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and

• secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.'

'All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission.'

2.4.5 PPW does not currently mandate a target for Biodiversity Net Gain, but does set out that:

'…development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity;'

'…planning decisions should incorporate measures which seek the creation, restoration and appropriate management of green networks and linkages between habitats and maintaining and enhancing other green infrastructure features and networks'.

2.4.6 The above approach encapsulates the 'mitigation hierarchy' described in British Standard BS 42020:2019[4], which involves the following step-wise process:

- **Avoidance –** avoiding adverse effects through good design;
- **Mitigation –** where it is unavoidable, mitigation measures should be employed to minimise adverse effects;
- **Compensation –** where residual effects remain after mitigation it may be necessary to provide compensation to offset any harm; and
- **Enhancement –** planning decisions often present the opportunity to deliver benefits for biodiversity, which can also be explored alongside the above measures to resolve potential adverse effects.

2.4.7 The measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development (BS 42020:2019, section 5.5).

2.5 Local Policy

2.5.1 The Local Policy for Cyngor Sir y Fflint Flintshire County Council is currently set out within the 'Flintshire Local Development Plan 2015 - 2030 (Adopted January 2023)'. Policies that relate specifically to ecology and biodiversity are set out below.

2.5.2 Policy EN2: Green Infrastructure

"Development proposals will be required to protect, maintain and enhance the extent, quality and connectivity of the green infrastructure network, including designated and non-designated green spaces (as shown on the proposals maps and listed in the table below), and where appropriate:

a. Create new green infrastructure linkages from the proposed development to the existing local network;

b. Fill in gaps in the existing network to improve connectivity.

Where the loss or damage of existing green infrastructure is unavoidable, appropriate mitigation and compensation will be required."

2.5.3 Policy EN3: Undeveloped Coast and Dee Estuary Corridor states:

"Within the undeveloped coast development will only be permitted where:

[4] British Standards Institution (2013) '*Biodiversity – Code of practice for planning and development*', BS 42020:2019

a. *It can be demonstrated a coastal location is essential;*

b. *It conserves and enhances the open character of the coast;*

c. *It would not unacceptably harm areas of nature conservation, landscape or biodiversity;*

d. *It would not harm existing or proposed recreational or active travel routes;*

e. *Extensive coastal protection measures are not required; and*

f. *It would not be potentially at risk of flooding nor unacceptably increase erosion or flooding or interfere with natural coastal processes."*

2.5.4 Policy EN6: Sites of Biodiversity and Geodiversity Importance states:

"Development will not be permitted that would result in an adverse effect on the integrity of sites of international nature conservation importance. Proposals where adverse effects on site integrity cannot be ruled out would not be supported.

Development likely to impact the special features of a Nationally Designated Site will only be granted in exceptional circumstances where appropriate compensation can be provided. Development proposals that would have a significant adverse effect on locally designated sites or site with other biodiversity and / or geological interest, including priority species, will only be permitted where:

a. *it can be demonstrated that the need for the development outweighs the biodiversity or geological importance of the site; and*

b. *it can be demonstrated that the development cannot reasonably be located elsewhere; and*

c. *any unavoidable harm is minimised by effective mitigation to ensure that there is no reduction in the overall biodiversity value of the area. Where this is not feasible compensation measures designed to create, restore and enhance biodiversity must be provided.*

Development that results in the restoration, enhancement and creation of habitats will be supported especially where this promotes the resilience of ecosystems."

2.5.5 Policy EN7: Development Affecting Trees, Woodlands and Hedgerows states:

"Development proposals that will result in significant loss of, or harm to, trees, woodlands or hedgerows of biodiversity, historic, and amenity value will not be permitted.

Where the impact of development affecting trees, woodlands or hedgerows is considered acceptable, development will only be permitted where:

a. *the development maximises their retention through sensitive design*

b. *measures; and*

c. *where the removal of trees is considered necessary, suitable replacements*

d. *shall be provided elsewhere within the site; and*

e. *it results in a net benefit in biodiversity."*

2.5.6 Policy EN7: Development In or Adjacent to Conservation Areas states:

"Development within or adjacent to a conservation area will only be permitted if it would preserve or enhance the character and appearance of the conservation area or its setting. New development in such locations must also be of a high standard of design, respond to the area's special characteristics, and pay particular regard to:

a. important views, vistas, street scenes, roofscapes, trees, open spaces, gaps and other features that contribute to the character or appearance of the conservation area;

b. the retention of historically significant boundaries or other elements that contribute to the established form of development;

c. the relationship to existing buildings and spaces, and pattern of development;

d. scale, height and massing, architectural design and detailing, the use of materials, boundary treatment, and public realm materials."

3 The River Dee Estuary SPA/Ramsar Site

3.1.1 The Dee Estuary is "a large funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. Where agricultural reclamation has not occurred, the saltmarshes grade into transitional brackish swamp vegetation on the upper shore."

3.1.2 The estuary "is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats, including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders" and in summer it "supports nationally important breeding colonies of two species of tern" and "is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for Sandwich terns post-breeding."

3.1.3 The SPA qualifies under article 4.1 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the GB populations of the species listed in Annex 1 (see Table 3.1):

Table 3.1. SPA qualifying bird species (Article 4.1).

Annex 1 Species	Count and Season	% of GB Population
Bar-tailed godwit *Limosa lapponica*	1,150 individuals – wintering	2.2%
Common tern *Sterna hirundo*	392 pairs – breeding	3.2%
Little tern *Sternula albifrons*	69 pairs – breeding	2.9%
Sandwich tern *Thalassia sandvicensis*	957 individuals – autumn passage	2.3%

3.1.4 The SPA qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex 1) (see Table 3.2):

Table 3.2. SPA qualifying migratory bird species (Article 4.2).

Migratory Species	Count and Season	% of Population
Redshank *Tringa totanus*	8,795 individuals – passage	5.9% Eastern Atlantic (wintering)
Shelduck *Tadorna tadorna*	7,725 individuals – wintering	2.6% Northwestern Europe
Teal *Anas crecca*	5,251 individuals – wintering	1.3% Northwestern Europe
Pintail *Anas acuta*	5,407 individuals – wintering	9.0% Northwestern Europe
Oystercatcher *Haematopus ostralegus*	22,677 individuals – wintering	2.5% Europe & N/W Africa (wintering)
Grey plover *Pluvialis squatarola*	1,643 individuals – wintering	1.1% Eastern Atlantic (wintering)
Knot *Calidris canutus*	12,394 individuals – wintering	3.5% NE Can/Grl/Iceland/NW Eur
Dunlin *Calidris alpina*	27,769 individuals – wintering	2.0% N Siberia/Europe/W Africa
Black-tailed godwit *Limosa limosa islandica*	1,747 individuals – wintering	2.5% Iceland (breeding)
Curlew *Numenius arquata*	3,899 individuals – wintering	1.1% Europe (breeding)
Redshank *Tringa totanus*	5,293 individuals – wintering	3.5% Eastern Atlantic (wintering)

Assemblage Qualification

3.1.5 In addition, The Dee Estuary Ramsar site qualifies under article 4.2 of the Directive (79/409/EEC) as it is "used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season."

4 Results

4.1 Legislation

4.1.1 All wild birds and their nests receive protection under Section 1 of the Wildlife and Countryside Act 1981 (as amended) in respect of killing and injury, and their nests, whilst being built or in use, cannot be taken, damaged or destroyed. Species included on Schedule 1 of the Act receive greater protection and are subject to special penalties (see Appendix 6322/3 for detailed provisions).

4.2 Conservation Status

4.2.1 The conservation importance of British bird species is categorised based on a number of criteria including the level of threat to a species' population status[5]. Species are listed as Green, Amber or Red. Red Listed species are considered to be of the highest conservation concern being either globally threatened and or experiencing a high/rapid level of population decline (>50% over the past 25 years). A number of birds are also S41 Priority Species. Red and Amber listed species and priority species should be assessed as important ecological features.

4.3 Survey Results

4.3.1 A total of 56 bird species were recorded during the surveys. The results are divided into "waterbirds" (27) and "landbirds" (29) in the tables that follow. "Waterbirds" include all species that are specifically associated with the estuary habitats, including all waterfowl, waders, gulls and terns. "Landbirds" include all species that are associated with terrestrial habitats.

4.3.2 The numbers of waterbirds recorded during each survey are shown in Table 4.1 below. These are limited to those observed within the River Dee estuary. The site itself contains no habitat to support any waterbird species.

Table 4.1: Numbers of each species of waterbird recorded during each survey. SPA/Ramsar qualifying species are shown in bold.

Species (and BTO species code)	RSPB listed	River Dee adjacent to the site										
		A	M	J	J	A	S	O	N	D	J	F
Canada goose (CG) *Branta canadensis*	Feral		2	30		6	1	89		46		9
Greylag goose (GJ) *Anser anser*	Feral							1				
Shelduck (SU) ***Tadorna tadorna***	Amber	3	2									
Gadwall (GA) *Mareca strepera*	Amber	2										
Wigeon (WN) *Mareca penelope*	Amber	1										
Mallard (MA) *Anas platyrhynchos*	Amber	4	1			3	2	23	43	45	10	11
Teal (T.) ***Anas crecca***	Amber					3		8		27	5	4
Goosander (GD) # *Mergus merganser*										2		1

[5] Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) *'Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man'* British Birds *108*, pp.708-746

Species (and BTO species code)	RSPB listed	River Dee adjacent to the site										
		A	M	J	J	A	S	O	N	D	J	F
Little grebe (LG) *Tachybaptus ruficollis*								2		4	2	
Oystercatcher (OC) ***Haematopus ostralegus***	Amber	2	10	1	1							1
Lapwing (L.) *Vanellus vanellus*	Red			2	11	2	25			15		
Curlew (CU) ***Numenius arquata***	Red							1				
Dunlin (DN) ***Calidris alpina***	Red					4	2			4		
Common sandpiper (CS) *Actitis hypoleucos*	Amber					2		1	4			1
Redshank (RK) ***Tringa totanus***	Amber				26	700	18	5	1	12	5	10
Greenshank (GK) *Tringa nebularia*	Amber					1		1	1	1		1
Black-headed gull (BH) *Chroicocephalus ridibundus*	Amber	42	15		30	50	26	13	42	80	54	67
Mediterranean gull (MU) *Larus melanocephalus*	Amber	2										
Common gull (CM) *Larus canus*	Amber									10	2	3
Herring gull (HG) *Larus argentatus*	Red	10	40	10	35	10	26		13	75	14	9
Great black-backed gull (GB) *Larus marinus*	Amber					1	1	1	2	2		2
Lesser black-backed gull (LB) *Larus fuscus*	Amber	4	2	6	6	2	10		4	15	1	
Common tern (CN) ***Sterna hirundo***	Amber	1		1	1							
Cormorant (CA) *Phalacrocorax carbo*		1		2	4	3	1	4	32	16	1	
Grey heron (H.) *Ardea cinerea*						1		2	1	1	3	
Little egret (ET) *Egretta garzetta*			1		12	11	7	3	3	1	2	1
Great egret (HW) *Egretta alba*	Amber										1	

4.3.3 The survey results for landbirds are shown in Table 4.2 below. These include the estimated numbers of territories within the site, and the maxima for passage and winter periods. The distribution of breeding birds is shown in Plan 6322/ECO6.

Table 4.2: Systematic list of 'landbird' species recorded.

Species (and BTO species code)	RSPB listed	South site			Notes
		Est. no. pairs	Passage max.	Winter max.	
Woodpigeon (WP) *Columba palumbus*	Amber	1		2	
Collared dove (CD) *Streptopelia decaocto*			2	2	
Sparrowhawk (SH) *Accipiter nisus*	Amber		1		Flying over.
Magpie (MG) *Pica pica*		1		6	
Carrion crow (C.) *Corvus corone*		1		4	

Species (and BTO species code)	RSPB listed	South site			Notes
		Est. no. pairs	Passage max.	Winter max.	
Blue tit (BT) *Cyanistes caeruleus*				8	
Great tit (GT) *Parus major*				5	
House martin (HM) *Delichon urbicum*	Amber		1		Flying over.
Long-tailed tit (LT) *Aegithalos caudatus*				7	
Chiffchaff (CC) *Phylloscopus collybita*		1			
Willow warbler (WW) *Phylloscopus trochilus*	Amber	0-1			
Blackcap (BC) *Sylvia atricapilla*		1			
Goldcrest (GC) *Regulus regulus*				1	
Wren (WR) *Troglodytes troglodytes*	Amber	2		2	
Starling (SG) *Sturnus vulgaris*	Red		40	40	
Blackbird (B.) *Turdus merula*		2		5	
Song thrush (ST) *Turdus philomelos*	Amber			8	
Redwing (RE) *Turdus iliacus*	Sch.1			7	
Fieldfare (FF) *Turdus pilaris*	Sch.1			4	
Mistle thrush (M.) *Turdus viscivorus*	Red		3	1	
Robin (R.) *Erithacus rubecula*		3		5	
House sparrow (HS) *Passer domesticus*	Red			20	From housing.
Dunnock (D.) *Prunella modularis*	Amber	3		1	
Pied wagtail (PW) *Motacilla alba*			1	1	
Meadow pipit (MP) *Anthus pratensis*	Amber			11	
Chaffinch (CH) *Fringilla coelebs*				100	
Greenfinch (GR) *Chloris chloris*	Red	1		1	
Goldfinch (GO) *Carduelis carduelis*		4		4	
Reed bunting (RB) *Emberiza schoeniclus*	Amber			1	

4.4 Evaluation

4.4.1 The surveys revealed relatively few numbers of birds using the Dee Estuary adjacent to the site, although there is a regular gathering of ducks, waders and gulls on the far bank, which occasionally holds higher numbers at high tide (for example, 700 Redshank in August). Significantly larger numbers of bird occur beyond the limit of the survey area.

4.4.2 At low tide birds are widely spread out throughout all areas of intertidal mud, saltmarsh and grazing marsh. As the tide rises, it pushes the birds from the lower reaches towards the higher areas, where they can rest at sites known as 'high tide roosts'. This means that birds were observed moving downriver (east to west) past the site on the rising tide to roost in the grazing marsh further north-west or even further afield, notably on the highest tides.

4.4.3 There are no habitats suitable for any of these wetland species within the site itself.

Annex 1 Species

4.4.4 None of the four species listed in the SPA citation were recorded during the surveys. Low numbers of Common Terns were observed flying up and downriver during the spring and summer. In summary, no Annex 1 species make significant use of the site.

Qualifying Migrant species

4.4.5 Of the ten species listed, Redshank was the only one recorded in the estuary in significant numbers. Shelduck, Teal, Oystercatcher, Curlew and Dunlin were recorded only in relatively small numbers. All of these species were typically observed widespread within the estuary and none were recorded within the sit, which is unsuitable to support wetland bird species.

The Site

4.4.6 The site itself supports no habitats suitable for wetland species. Even habitat for terrestrial species is limited, with breeding species including very low numbers of Woodpigeon, Wren, Dunnock, Greenfinch and possibly Willow Warbler, all Red or Amber List species that remain very common and widespread both locally and nationally.

4.4.7 In early 2023 the site was largely cleared of scrub and trees. As a result, very little suitable breeding bird habitat remains present within this area.

Plan 6322/ECO1:

Site Location

Key:

Site Location

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Connah's Quay (South)	PROJECT
Site Location	TITLE
6322/ECO1	DRAWING NO.
A/BG	REV
April 2023	DATE

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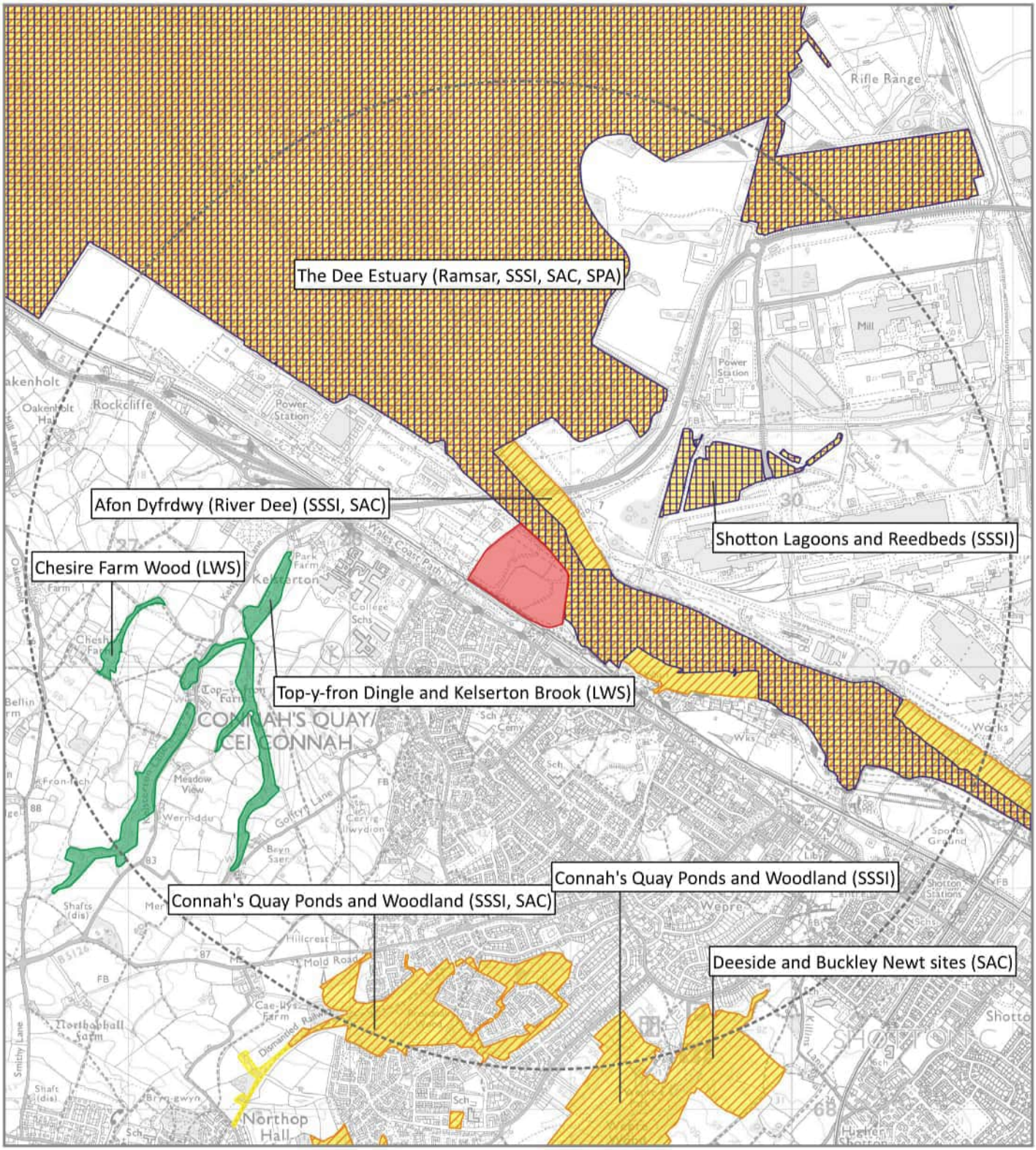
Plan 6322/ECO2:

Ecological Designations



Key:

- Site Location
- 2km Study Area
- Ramsar Site
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)

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Connah's Quay (South)	PROJECT
Ecological Designations	TITLE
6322/ECO2	DRAWING NO.
A/BG	REV
April 2023	DATE

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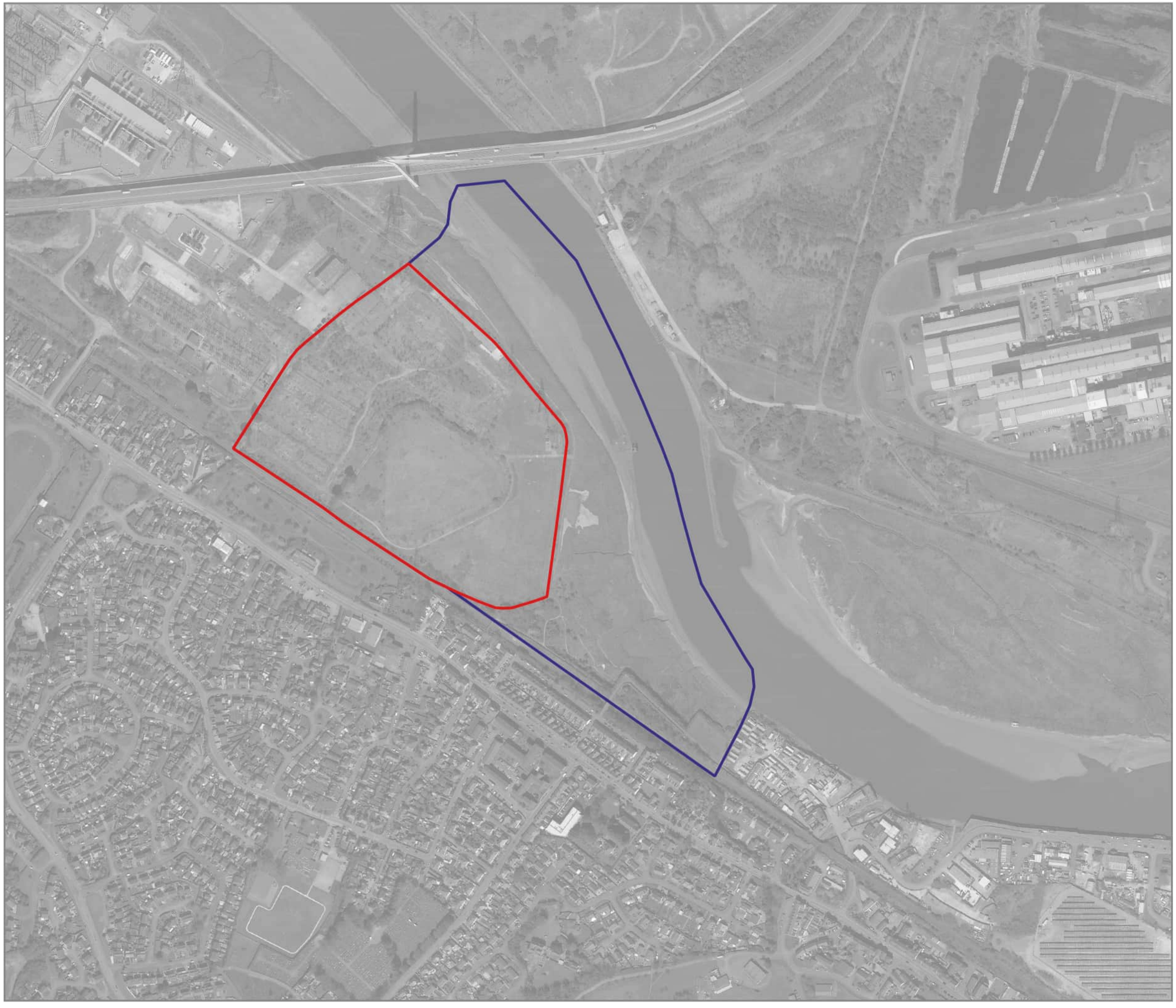
Plan 6322/ECO5:

Wintering and Passage Bird Surveys



Key:

Site Boundary

Survey Area

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Connah's Quay (South)	PROJECT
Extent of Wintering and Passage Bird Surveys	TITLE
6322/ECO5	DRAWING NO.
A/BG	REV
April 2023	DATE

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Plan 6322/ECO6:

Breeding Bird Surveys

Bird Species:

- B. Blackbird
- BC Blackcap
- C. Carrion Crow
- CC Chiffchaff
- GO Goldfinch
- R. Robin
- D. Dunnock
- GA Gadwall
- WN Whitethroat
- WP Woodpigeon
- WR Wren
- WW Willow Warbler
- GR Greenfinch

Key:

- Site Boundary
- Breeding / Probable Breeding (BOCC Red List)
- Possible Breeding (BOCC Red List)
- Breeding / Probable Breeding (BOCC Amber List Species)
- Possible Breeding (BOCC Amber List Species)
- Breeding / Probable Breeding (BOCC Green List - Not Threatened)
- Possible Breeding (BOCC Green List - Not Threatened)

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Connah's Quay (South)	PROJECT
Breeding Bird Survey	TITLE
6322/ECO6	DRAWING NO.
A/BG	REV
April 2023	DATE

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Appendix 6322/1:

Desk Study Data

EC Directive 79/409 on the Conservation of Wild Birds: Citation for Special Protection Area (SPA)

Name: The Dee Estuary

Unitary Authority/County: Cheshire West and Chester, Denbighshire, Flintshire, Wirral.

Boundary of the SPA: The Dee Estuary SPA encompasses the Dee Estuary/Aber Afon Dyfrdwy Site of Special Scientific Interest (SSSI); the dunes and intertidal foreshore at Gronant Dunes and Talacre Warren SSSI; the freshwater marsh at Inner Marsh Farm SSSI; and the lagoons and reedbeds at Shotton Lagoons and Reedbeds. The boundary of the SPA is shown on the map enclosed.

Site description: The Dee Estuary lies on the border between England and Wales on the north-west coast of Britain. It is a large, funnel-shaped, sheltered estuary, which supports extensive areas of intertidal sand and mudflats and saltmarsh. Where agricultural reclamation has not occurred, the saltmarshes grade into transitional brackish and swamp vegetation on the upper shore. The site also includes the three sandstone islands of Hilbre, with their important cliff vegetation and maritime heathland and grassland. The two shorelines of the estuary show a marked contrast between the industrialised usage of the coastal belt in Wales and residential and recreational usage in England. The site is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders; in summer the site supports nationally important breeding colonies of two species of tern. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for Sandwich terns post-breeding.

Size of SPA: 14,291.56 ha.

European ornithological interest of SPA:

Qualifying species:
The site qualifies under **Article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex I species	Count and Season	Period	% of GB population
Bar-tailed Godwit *Limosa lapponica*	1,150 individuals - wintering	5 year peak mean 1994/95 - 1998/99	2.2%
Common Tern *Sterna hirundo*	392 pairs - breeding	5 year mean 1995 – 1999	3.2%
Little Tern *Sterna albifrons*	69 pairs – breeding	5 year mean 1995 - 1999	2.9%
Sandwich Tern *Sterna sandvicensis*	957 individuals- autumn passage	5 year mean 1995 - 1999	2.3%

The site qualifies under **Article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	**Count and Season**	**Period**	**% of population**
Redshank *Tringa totanus*	8,795 individuals - passage	5 year mean 1994/95 – 1998/99	5.9% Eastern Atlantic (wintering)
Shelduck *Tadorna tadorna*	7,725 individuals - wintering	5 year mean 1994/95 - 1998/99	2.6% Northwestern Europe
Teal *Anas crecca*	5,251 individuals - wintering	5 year mean 1994/95 - 1998/99	1.3% Northwestern Europe
Pintail *Anas acuta*	5,407 individuals - wintering	5 year mean 1994/95 - 1998/99	9.0% Northwestern Europe
Oystercatcher *Haematopus ostralegus*	22,677 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Europe & N/W Africa (wintering)
Grey Plover *Pluvialis squatarola*	1,643 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Eastern Atlantic (wintering)
Knot *Calidris canutus islandica*	12,394 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% NE Can/Grl/ Iceland/NW Eur
Dunlin *Calidris alpina*	27,769 individuals - wintering	5 year mean 1994/95 - 1998/99	2.0% N Siberia/Europe/ W Africa
Black-tailed Godwit *Limosa limosa islandica*	1,747 individuals - wintering	5 year mean 1994/95 - 1998/99	2.5% Iceland (breeding)
Curlew *Numenius arquata*	3,899 individuals - wintering	5 year mean 1994/95 - 1998/99	1.1% Europe (breeding)
Redshank *Tringa totanus*	5,293 individuals - wintering	5 year mean 1994/95 - 1998/99	3.5% Eastern Atlantic (wintering)

Assemblage qualification
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 120,726 individual waterbirds (5 year peak mean 1994/95 - 1998/99), including: Great Crested Grebe *Podiceps cristatus*, Cormorant *Phalacrocorax carbo*, Shelduck *Tadorna tadorna*, Wigeon *Anas penelope*, Teal *Anas crecca*, Pintail *Anas acuta*, Oystercatcher *Haematopus ostralegus*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*, Sanderling *Calidris alba*, Dunlin *Calidris alpina*, Black-tailed Godwit *Limosa limosa islandica*, Bar-tailed Godwit *Limosa lapponica*, Curlew *Numenius arquata* and Redshank *Tringa totanus*.

Non-qualifying species of interest: Leach's Petrel *Oceanodroma leucorhoa*, Little Egret *Egretta garzetta*, Bewick's Swan *Cygnus columbianus bewickii*, Whooper Swan *Cygnus cygnus*, Smew *Mergellus albellus*, Hen Harrier *Circus cyaneus*, Merlin *Falco columbarius*, Peregrine *Falco peregrinus*, Golden Plover *Pluvialis apricaria*, Ruff *Philomachus pugnax*, Wood Sandpiper *Tringa glareola*, Short-eared Owl *Asio flammeus* and Kingfisher *Alcedo atthis* (all Annex 1 species) occur in non-breeding numbers of less than European importance (less than 1% of the GB population).

Status of SPA:
The Dee Estuary was first classified as a Special Protection Area on 17 July 1985. The boundaries and site features were revised on 10 December 2009.

European Site Conservation Objectives for The Dee Estuary Special Protection Area Site Code: UK9013011

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying Conservation Advice document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
A052 *Anas crecca*; Eurasian teal (Non-breeding)
A054 *Anas acuta*; Northern pintail (Non-breeding)
A130 *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A160 *Numenius arquata*; Eurasian curlew (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding)
A193 *Sterna hirundo*; Common tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage

This is a cross border site

This site crosses the border between England and Wales. Some features may only occur in one Country. The advice of Natural Resources Wales should therefore be sought separately.

This is a European Marine Site

This SPA is a part of the Dee Estuary European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS.

Natural England's formal Conservation Advice for European Marine Sites can be found via GOV.UK.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 4). This document updates and replaces an earlier version dated 5 February 2016 to reflect the consolidation of the Habitats Regulations in 2017.

Special Areas of Conservation

Dee Estuary/ Aber Dyfrdwy

Designated Special Area of Conservation (SAC)

Country	England/Wales
Unitary Authority	Cheshire, East Wales, Extra-Regio, Merseyside, West Wales and The Valleys
Centroid*	SJ191819
Latitude	53.32833333
Longitude	-3.216111111
SAC EU Code	UK0030131
Status	Designated Special Area of Conservation (SAC)
Area (ha)	15805.27

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

Location of Dee Estuary/ Aber Dyfrdwy SAC

General site character

- Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins) (81.8%)
- Salt marshes, Salt pastures, Salt steppes (16.1%)
- Coastal sand dunes, Sand beaches, Machair (0.7%)
- Shingle, Sea cliffs, Islets (0.5%)
- Bogs, Marshes, Water fringed vegetation, Fens (0.4%)
- Humid grassland, Mesophile grassland (0.2%)
- Improved grassland (0.1%)
- Broad-leaved deciduous woodland (0.1%)
- Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (0.1%)

Download the Standard Data Form for this site as submitted to Europe (PDF <100kb)

Note When undertaking an appropriate assessment of impacts at a site, all features of European importance (both primary and non-primary) need to be considered.

Annex I habitats that are a primary reason for selection of this site

- **1140 Mudflats and sandflats not covered by seawater at low tide**
  Species occurrence description not yet available.

- **1310 Salicornia and other annuals colonizing mud and sand**

  The Dee Estuary is representative of pioneer glasswort *Salicornia* spp. saltmarsh in the north-west of the UK. *Salicornia* spp. saltmarsh forms extensive stands in the Dee, especially on the more sandy muds where there is reduced tidal scour. It mainly occurs on the seaward fringes as a pioneer community, and moving landwards usually forms a transition to common saltmarsh-grass *Puccinellia maritima* saltmarsh (SM10). There is also a low frequency of *Salicornia* spp. extending well inland. Associated species often include annual sea-blite *Suaeda maritima* and hybrid scurvy grass *Cochlearia x hollandica*.

- **1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
  The Dee Estuary is representative of **H1330 Atlantic salt meadows** in the north-west of the UK. It forms the most extensive type of saltmarsh in the Dee, and since the 1980s it has probably displaced very large quantities of the non-native common cord-grass *Spartina anglica*. The high accretion rates found in the estuary are likely to favour further development of this type of vegetation. The saltmarsh is regularly inundated by the sea; characteristic salt-tolerant perennial flowering plant species include common saltmarsh-grass *Puccinellia maritima*, sea aster *Aster tripolium*, and sea arrowgrass *Triglochin maritima*. In a few areas there are unusual transitions to wet woodland habitats.

Annex I habitats present as a qualifying feature, but not a primary reason for

selection of this site

- **1130 Estuaries**
- **1210 Annual vegetation of drift lines**
- **1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts**
- **2110 Embryonic shifting dunes**
- **2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"**
- **2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" * Priority feature**
- **2190 Humid dune slacks**

Annex II species that are a primary reason for selection of this site

- Not Applicable

Annex II species present as a qualifying feature, but not a primary reason for site selection

- **1095 Sea lamprey** *Petromyzon marinus*
- **1099 River lamprey** *Lampetra fluviatilis*
- **1395 Petalwort** *Petalophyllum ralfsii*

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

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CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

FLINTSHIRE **MYNYDD Y FFLINT/FLINT MOUNTAIN**

Date of Notification: 19 May 2011

National Grid Reference: SJ 243709

OS Maps: 1:50,000 Sheet number: 116
1:10,000 Sheet number: SJ27SW

Site Area: 25.79ha

Description

The site is of special interest for its stands of unimproved neutral grassland and semi-natural broadleaved woodland, which occur in association with scrub, fen-meadow and swamp vegetation. Mynydd y Fflint/Flint Mountain SSSI is located 1km to the south of Flint, north of the village of Flint Mountain, at an altitude ranging from 35 - 70m.

The site follows the course of a brook within a valley with gentle slopes extending on either side. The slopes are free draining, with the underlying geology consisting of mudstones of the Upper Carboniferous Period, which are overlain by mostly till with some glacial sands and gravels.

The neutral grassland areas on the drier slopes are of high floristic quality and hold a range of grasses, including red fescue *Festuca rubra*, sweet vernal-grass *Anthoxanthum odoratum*, common bent *Agrostis capillaris*, Yorkshire fog *Holcus lanatus*, and crested dog's-tail *Cynosurus cristatus*. Herbs are prominent, with frequent to abundant common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata* and red clover *Trifolium pratense*, and frequent field woodrush *Luzula campestris* and bulbous buttercup *Ranunculus bulbosus*. Some notable plants include pale flax *Linum bienne* and an inland population of rest harrow *Ononis repens*.

Alder *Alnus glutinosa* with grey willow *Salix cinerea* dominates the large areas of semi-natural broadleaved woodland found mainly along the valley bottom. The ground flora varies greatly with areas dominated by great horsetail *Equisetum telmateia* with extensive beds of lesser pond sedge *Carex acutiformis* with scattered marsh willowherb *Epilobium palustre*; whilst other areas have frequent ivy *Hedera helix* with bramble *Rubus fruticosus* and yellow archangel *Lamiastrum galeobdolon*.

In places the vegetation grades into swamp dominated by lesser pond sedge *Carex acutiformis*, with scattering of associates such as water mint *Mentha aquatica*, great willowherb *Epilobium hirsutum*, marsh horsetail *Equisetum palustre*, and marsh marigold *Caltha palustris*. This in turn gives way to areas of rich mixed fen with the addition of the locally uncommon greater tussock sedge *Carex paniculata* and sneezwort *Achillea ptarmica*. Some notable associated species in this vegetation included figwort *Scrophularia nodosa*, and hemp agrimony *Eupatorium*

cannabinum.

The transition between the vegetation communities is well developed with small areas of fen-meadow dominated by the locally uncommon blunt flowered rush *Juncus subnodulosus* accompanied by fen bedstraw *Galium uliginosum*, angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria*, marsh valerian *Valeriana dioica* and marsh thistle *Cirsium palustr*e. Mynydd y Fflint/Flint Mountain is only the second known site for this fen-meadow community in the North East Wales.

The site also supports a variety of other semi-natural vegetation types including areas bracken, scrub and other broadleaved woodland communities.

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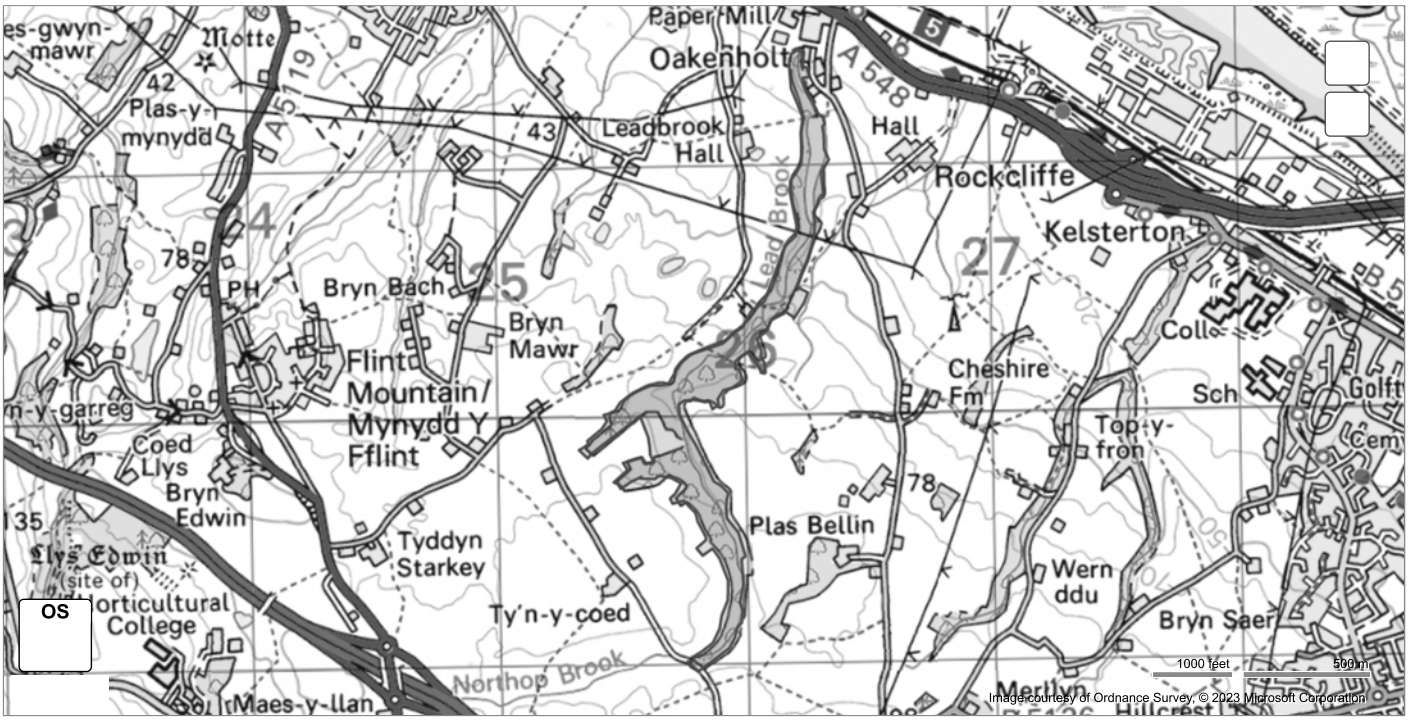
Safleol

A Local Sites System for Wales

26NE10: Leadbrook Wood

Location:	Flintshire
Centroid Grid Reference:	SJ259701
Area:	35.1 ha
Site Description:	Semi-natural broad-leaved woodland occupying the dingles in which the Lead Brook and its tributaries flow. In several areas drainage is impeded. The woodland canopy is mainly dominated by ash and sycamore with some oak alder, beech, common lime and silver birch. The shrub layer has abundant holly, hazel and wych elm. Also present are hawthorn and grey willow. The ground flora has frequent dog's mercury, bramble, wood anemone, enchanter's nightshade, bluebell, opposite-leaved golden saxifrage and wood speedwell. In wet areas of the southern part of the wood, marsh marigold, giant horsetail and meadowsweet are prominent. The northern tip of the woodland is mixed. In the north, the woodland surrounds a reservoir and alder and oak are dominant with hemlock water-dropwort, yellow flag and figwort. Near Ty'n-y-coed there is a semi-improved and a species-rich marshy grassland, with oval sedge, ragged robin, common spotted orchid, sharp-flowered rush, cuckoo flower, carnation sedge and meadowsweet. On the slope above this is a herb-rich meadow with pignut, black knapweed, cat's-ear, crested dog's tail and sweet vernal grass.
Habitats:	Broad-leaved semi-natural woodland (30.241 ha), Mixed plantation (1.57 ha), Semi-improved neutral grassland (0.721 ha), Marsh/marshy grassland (0.438 ha), Swamp (0.278 ha), Standing water (1.945 ha)
Designation Reason:	Broad-leaved woodland and scrub, Pasture/meadow and scrub

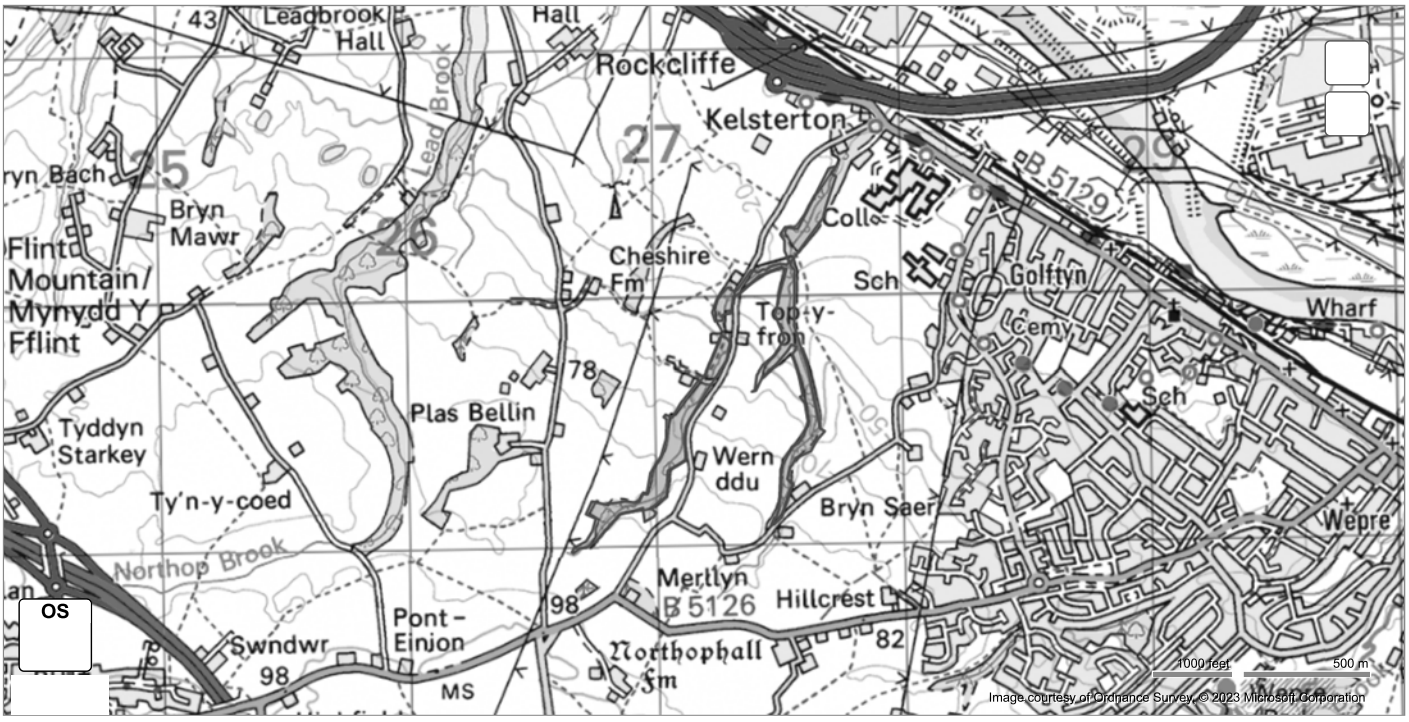


Safleol

A Local Sites System for Wales

26NE09: Top-y-fron Dingle and Kelserton Brook

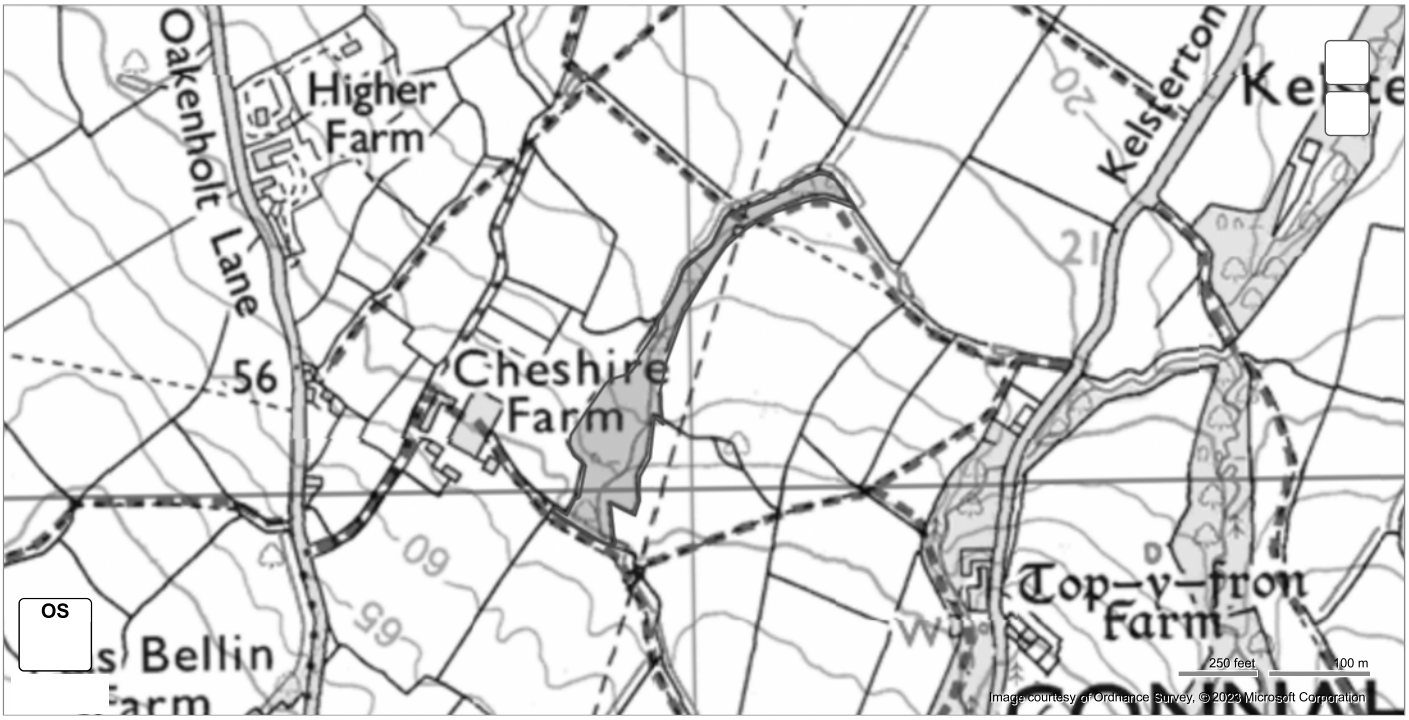
Location:	Flintshire
Centroid Grid Reference:	SJ273696
Area:	16.4 ha
Site Description:	Semi-natural broad-leaved woodland occupying two narrow steep-sided steam valleys that join into one south of Kelsterton. The dominant woodland canopy species is sycamore, but sessile oak, alder, ash and birch are all locally dominant. The Kelsterton Brook section also has common lime and yew. The shrub layer is variable. Top-y-Fron Dingle has a shrub layer of holly, hazel, elder and canopy saplings. The northern section of Kelsterton Brook lacks a shrub layer and the southern section has abundant elder but rhododendron and other introduced species are locally dominant. There is a rich herb flora. In Top-y-Fron Dingle bramble, ramsons, opposite-leaved golden saxifrage, dog's mercury, wood sorrel and bryophytes are all frequent. The herb layer in the Kelsterton Dingle has frequent wood speedwell, dog's mercury, red campion with some nettle, bramble, bluebell, ramsons and rough meadow-grass. The northern part is dominated by rough meadow-grass.
Habitats:	Broad-leaved semi-natural woodland (16.335 ha)
Designation Reason:	Broad-leaved woodland and scrub



Safleol
A Local Sites System for Wales

27SE01: Cheshire Farm Wood

Location:	Flintshire
Centroid Grid Reference:	SJ269701
Area:	1.6 ha
Site Description:	Semi-natural broad-leaved woodland following the course of a small stream. The woodland canopy is dominated by sessile oak with some beech, sycamore and ash. The shrub layer contains wych elm, hawthorn, hazel and beech. The ground flora has abundant wood melick, soft grass and bluebell with pignut, wood anemone, wood speedwell, bramble and greater stitchwort.
Habitats:	Broad-leaved semi-natural woodland (1.617 ha)
Designation Reason:	Broad-leaved woodland and scrub



Appendix 6322/2:

Evaluation Methodology

Evaluation Methodology

1. The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[1].

Importance of Ecological Features

2. Ecological features within the site/study area have been evaluated in terms of whether they qualify as 'important ecological features'. In this regard, CIEEM guidance states that *"it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable".*

3. Various characteristics contribute to the importance of ecological features, including:

- Naturalness;
- Animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- Ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity;
- Habitat connectivity and/or synergistic associations;
- Habitats and species in decline;
- Rich assemblages of plants and animals;
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

4. As an objective starting point for identifying important ecological features, European, national and local governments have identified sites, habitats and species which form a key focus for biodiversity conservation in the UK, supported by policy and legislation. These are summarised by CIEEM guidance as follows:

Designated Sites

- Statutory sites designated or classified under international conventions or European legislation, for example World Heritage Sites, Biosphere Reserves, Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA);

[1] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*', Chartered Institute of Ecology and Environmental Management, Winchester

- Statutory sites designated under national legislation, for example Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
- Locally designated wildlife sites, e.g. Local Wildlife Sites (LWS).

Biodiversity Lists

- Habitats and species of principal importance for the conservation of biodiversity in England and Wales (largely drawn from UK BAP priority habitats and priority species), often referred to simply as Priority Habitats / Species;
- Local BAP priority species and habitats.

Red Listed, Rare, Legally Protected Species

- Species of conservation concern, Red Data Book (RDB) species;
- Birds of Conservation Concern;
- Nationally rare and nationally scarce species;
- Legally protected species.

5. In addition to this list, other features may be considered to be of importance on the basis of local rarity, where they enable effective conservation of other important features, or play a key functional role in the landscape.

<u>Assigning Level of Importance</u>

6. The importance of an ecological feature should then be considered within a defined geographical context. Based on CIEEM guidance, the following frame of reference is used:

- International (European);
- National;
- Regional;
- County;
- District;
- Local (e.g. Parish or Neighbourhood);
- Site (not of importance beyond the immediate context of the site).

7. Features of 'local' importance are those considered to be below a district level of importance, but are considered to appreciably enrich the nature conservation resource or are of elevated importance beyond the context of the site.

8. Where features are identified as 'important' based on the list of key sites, habitats and species set out above, but are very limited in extent or quality (in terms of habitat resource or species population) and do not appreciably contribute to the biodiversity interest beyond the context of the site, they are considered to be of 'site' importance.

9. In terms of assigning the level of importance, the following considerations are relevant:

Designated Sites

10. For designated sites, importance should reflect the geographical context of the designation (e.g. SAC/SPA/Ramsar sites are designated at the international level whereas SSSIs are designated at the national level). Consideration should be given to multiple designations as appropriate (where an area is subject to differing levels of nature conservation designations).

Habitats

11. In certain cases, the value of a habitat can be measured against known selection criteria, e.g. SAC selection criteria, 'Guidelines for the selection of biological SSSIs' and the Hedgerows Regulations 1997. However, for the majority of commonly encountered sites, the most relevant habitat evaluation will be at a more localised level and based on relevant factors such as antiquity, size, species-diversity, potential, naturalness, rarity, fragility and typicalness (Ratcliffe, 1977). The ability to restore or re-create the habitat is also an important consideration, for example in the case of ancient woodland.

12. Whether habitats are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Habitats of Principal Importance' or 'Priority Habitats', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular habitat under a BAP does not in itself imply any specific level of importance.

13. Habitat inventories (such as habitat mapping on the MAGIC database) or information relating to the status of particular habitats within a district, county or region can also assist in determining the appropriate scale at which a habitat is of importance.

Species

14. Deciding the importance of species populations should make use of existing criteria where available. For example, there are established criteria for defining nationally and internationally important populations of waterfowl. The scale within which importance is determined could also relate to a particular population, e.g. the breeding population of common toads within a suite of ponds or an otter population within a catchment.

15. When determining the importance of a species population, contextual information about distribution and abundance is fundamental, including trends based on historical records. For example, a species could be considered particularly important if it is rare and its population is in decline. With respect to rarity, this can apply across the geographic frame of reference and particular regard is given to populations where the UK holds a large or significant proportion of the international population of a species.

16. Whether species are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Species of Principal Importance' or 'Priority Species', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular species under a BAP does not in itself imply any specific level of importance.

17. Species populations should also be considered in terms of the potential zone of influence of the proposals, i.e. if the entire species population within the site and surrounding area were to be affected by the proposed development, would this be of significance at a local, district, county or wider scale? This should also consider the foraging and territory ranges of individual species (e.g. bats roosting some distance from site may forage within site whereas other species such as invertebrates may be more sedentary).

Appendix 6322/3:

Legislation Summary

LEGISLATION SUMMARY

1. In England and Wales primary legislation is made by the UK Parliament, and in Scotland by the Scottish Parliament, in the form of Acts. The main piece of legislation relating to nature conservation in the UK is the Wildlife and Countryside Act 1981 (as amended).

2. Acts of Parliament confer powers on Ministers to make more detailed orders, rules or regulations by means of secondary legislation in the form of statutory instruments. Statutory instruments are used to provide the necessary detail that would be too complex to include in an Act itself[1]. The provisions of an Act of Parliament can also be enforced, amended or updated by secondary legislation.

3. In summary, the key pieces of legislation relating to nature conservation in the UK are:

    - Wildlife and Countryside Act 1981 (as amended)
    - Protection of Badgers Act 1992
    - Hedgerows Regulations 1997
    - Countryside and Rights of Way (CRoW) Act for England and Wales 2000
    - Natural Environment and Rural Communities Act 2006
    - Conservation of Habitats and Species Regulations 2017

4. A brief summary of the relevant legislation is provided below. The original Acts and instruments should be referred to for the full and most up to date text of the legislation.

5. **Wildlife and Countryside Act 1981 (as amended)**. The WCA Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) identified for their flora, fauna, geological or physiographical features. The Act contains strict measures for the protection and management of SSSIs.

6. The Act also refers to the treatment of UK wildlife including protected species listed under Schedules 1 (birds), 5 (mammals, herpetofauna, fish, invertebrates) and 8 (plants).

7. Under Section 1(1) of the Act, all wild birds are protected such that is an offence to intentionally:

    - Kill, injure or take any wild bird;
    - Take, damage or destroy the nest of any wild bird whilst in use* or being built;
    - Take or destroy an egg of any wild bird.

    * The nests of birds that re-use their nests as listed under Schedule ZA1, e.g. Golden Eagle, are protected against taking, damage or destruction irrespective of whether they are in use or not.

8. Offences in respect of Schedule 1 birds are subject to special, i.e. higher, penalties. Schedule 1 birds also receive greater protection such that it is an offence to intentionally or recklessly:

    - Disturb any wild bird included in Schedule 1 while it is building a nest or while it is in, on or near a nest containing eggs or young;
    - Disturb dependent young of such a bird.

[1] http://www.parliament.uk/business/bills-and-legislation/secondary-legislation/statutory-instruments/

9. Under Section 9(1) of the Act, it is an offence to:

- Intentionally kill, injure or take any wild animal included in Schedule 5.

10. In addition, under Section 9(4) it is an offence to intentionally or recklessly:

- Obstruct access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection; or
- Disturb any wild animal included in Schedule 5 while occupying a structure or place which it uses for that purpose.

11. Under Section 13(1) it is an offence:

- To intentionally pick, uproot or destroy any wild plant listed in Schedule 8; or
- Unless the authorised person, to intentionally uproot any wild plant not included in Schedule 8.

12. The Act also contains measures (S.14) for preventing the establishment of non-native species that may be detrimental to native wildlife, prohibiting the introduction into the wild of animals (releases or allows to escape) and plants (plants or causes to grow) listed under Schedule 9.

13. **Protection of Badgers Act 1992.** The Act aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. It should be noted that the legislation is not intended to prevent properly authorised development. Under the Act it is an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat* a Badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett# (this includes disturbing Badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

* the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence

\# A sett is defined as "*any structure or place which displays signs indicating current use by a Badger*". Natural England advice (June 2009) is that a sett is protected so long as such signs remain present, which in practice could potentially be for some time after the last actual occupation by Badger. Interference with a sett includes blocking tunnels or damaging the sett in any way

14. Licences can be obtained from the Statutory Nature Conservation Organisation (SNCO) for development activities that would otherwise be unlawful under the legislation, provided there is suitable justification. The SNCO for England is Natural England.

15. **Hedgerows Regulations 1997**. 'Important' hedgerows (as defined by the Regulations) are protected from removal (up-rooting or otherwise destroying). Various criteria specified in the Regulations are employed to identify 'important' hedgerows for wildlife, landscape or historical reasons.

16. **Countryside and Rights of Way (CRoW) Act for England and Wales 2000.** The CRoW Act provides increased measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation. Schedule 12 of the Act amends the species provisions of the WCA 1981, strengthening the legal protection for threatened species. The Act also introduced a duty on Government to have regard to the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

17. **Natural Environment and Rural Communities Act 2006.** Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as local planning authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when exercising their normal functions. 56 habitats and 943 species of principal importance are included on the S41 list. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan (BAP).

18. **Conservation of Habitats and Species Regulations 2017 (as amended).** The Regulations enact the European Union's Habitats Directive (92/43/EEC) in the UK. The Habitats Directive was designed to contribute to the maintenance of biodiversity within member states through the conservation of sites, known in the UK as Special Areas of Conservation (SACs), containing habitats and species selected as being of EC importance (as listed in Annexes I and II of the Habitats Directive respectively). Member states are required to take measures to maintain or restore these natural and semi-natural habitats and wild species at a favourable conservation status.

19. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs)[2] classified under Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). These sites constitute the Natura 2000 network. The Regulations impose restrictions on planning decisions likely to significantly affect SPAs or SACs.

20. The Regulations also provide protection to European Protected Species of animals that largely overlaps with the WCA 1981, albeit the provisions are generally stricter. Under Regulation 43 it is an offence, *inter alia*, to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species;
- Deliberately disturb any wild animals of any such species, including in particular any disturbance likely to impair their ability to survive, to breed or reproduce, to rear or nurture their young, to hibernate or migrate, or which is likely to affect significantly their local distribution or abundance;
- Deliberately take or destroy the eggs of such an animal;
- Damage or destroy a breeding site or resting place of such an animal.

21. Similar protection is afforded to European Protected Species of plants, as detailed under Regulation 47.

22. The Regulations do provide a licensing system that permits otherwise illegal activities in relation to European Protected Species, subject to certain tests being fulfilled.

[2] Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC) (aka the Birds Directive), which came into force in April 1979. SPAs are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.

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Connah's Quay Power Station:
Northern Land Parcel

Reptile Surveys

July 2023

Quality Management	
Client:	Uniper UK Ltd
Project:	Connah's Quay Power Station: Northern Land Parcel
Report Title:	Reptile Surveys
Project Number:	ECO-6322
File Reference:	6322 Reptiles North 2023 dv3 /ADB
Date:	10/07/2023

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Legal Guidance

The information set out within this report in no way constitutes a legal opinion on the relevant legislation (refer to the relevant Appendix for the main provisions of the legislation). The opinion of a legal professional should be sought if further advice is required.

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Executive Summary

i) **Introduction.** Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake baseline ecological surveys of the Northern Land Parcel at Connah's Quay Power Station, Connah's Quay, Flintshire.

ii) **Survey.** A desk study was undertaken in August 2021 sourcing biological records from the area of the site, including records of reptiles. The site contains habitat with the potential to support reptiles. Reptile surveys were subsequently undertaken at the site in May 2022 in accordance with standard methodology.

iii) **Desk Study.** The site lies adjacent to the statutory designation Dee Estuary (SPA, Ramsar and SAC). This is a vast site which extends substantially from the site's northern and western boundaries. Reptiles are not a reason for the designation of this site, nor are they mentioned in the citations of any other statutory or non-statutory ecological designations in the wider area of the site. The desk study returned a single record of one Common Lizard from within the 2km search area, dating from 2013.

iv) **Survey Findings.** The surveys found no reptiles to be present within the site on any survey occasion. It is therefore concluded that reptiles are likely to be absent from the site.

v) **Conclusions.** Reptiles are likely to be absent from the site. No further actions are required in respect of reptiles should works be undertaken at the site.

1 Introduction

1.1 Background and Proposals

1.1.1 Aspect Ecology was commissioned by Uniper UK Ltd in July 2021 to undertake baseline ecological surveys of the Northern Land Parcel at Connah's Quay Power Station, Connah's Quay, approximately centred at grid reference SJ 270 716 (see Plan 6322/ECO1), hereafter referred to as 'the site'.

1.1.2 Because of the presence of suitable habitat to support reptiles within the site, and the return of one record of reptiles from the desk study, reptile surveys were undertaken in May 2022.

1.2 Site Overview

1.2.1 The site is located in north-east Flintshire in North Wales (see Plan 6322/ECO1). The site is bounded to the north-east by the River Dee, beyond which extend large areas of open wetland associated with the River Dee Estuary. Connah's Quay Power Station is located immediately adjacent to the site's south-eastern boundary and a railway line and industrial development, with associated planting, forms the site's southern boundary.

1.2.2 The site itself comprises grassland fields with roads, treelines, hedgerows, along with areas of scrub and tall ruderal vegetation.

1.3 Purpose of the Report

1.3.1 This report documents the methods and findings of the desk study in relation to reptiles, and the reptile surveys carried out. The importance of the site for reptiles is evaluated.

2 Methodology

2.1 Desktop Study

2.1.1 Background information relevant to the site and its immediate surroundings to a distance of 2km was sourced from the North Wales Environmental Information Service (Cofnod) in August 2021. The data obtained comprised information on designated sites and species records.

2.1.2 Information on statutory designations was obtained from the MAGIC database[1], which uses data provided by Natural England, from within an extended search area of 25km. The MAGIC database was also searched for the presence of Priority Habitats within or adjacent to the site. Relevant information is shown on Plan 6322/ECO2.

2.2 Reptile Surveys

Presence/Absence Survey

2.2.1 The site was surveyed in August 2021 to assess the general ecological value of the land and to identify the main habitats and ecological features present. Habitats present are shown on Plan 6322/ECO3.

2.2.2 Because of the presence of habitats suitable to support reptiles, a reptile survey was subsequently undertaken in May 2022. The survey set out to confirm whether or not reptiles were present at the site, and to estimate the sizes of any populations present.

2.2.3 The reptile survey was undertaken in accordance with standard guidance[2]. A total of 125 50x50cm sheets of thick roofing felt were placed within areas of suitable habitat within the site to serve as artificial refugia (see Plan 6322/ECO4). This corresponds to an approximate density of 5.5 refugia per hectare of suitable habitats, which corresponds to the recommended five to ten refugia per hectare.

2.2.4 Refugia provide sheltering sites for reptiles that will tend to heat up more quickly than their surroundings in the morning and remain warmer than their surroundings into the late afternoon. Reptiles bask on and beneath refugia so as to raise their body temperature, enabling them to forage. The survey method is based on checking for the presence of reptiles on or beneath refugia in the morning or evening when basking reptiles are most likely to be observed.

2.2.5 The refugia were deployed and left undisturbed for 1-2 weeks prior to the first survey visit to allow reptiles to find and make use of them. Following this initial settling period, all refugia were checked for the presence of reptiles on seven occasions during optimal weather conditions (taken as not during continual heavy rain or strong winds, ambient temperature 9-18°C). Weather conditions during the survey visits are shown in Table 2.1 below.

[1] Multi-Agency Geographic Information for the Countryside (MAGIC), https://magic.defra.gov.uk/

[2] Froglife Advice Sheet 10 (1999) '*Reptile Survey - an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.*'

Table 2.1. Reptile survey dates and weather conditions.

Survey Date	Weather Conditions			
	Wind (BF)	Temp(°C)	Cloud Cover (%)	Precipitation
06/05/2022	3	16-17	0	Dry
09/05/2022	3	16	75	Dry
12/05/2022	3	14-16	65	Dry
16/05/2022	3	18-20	100	Light Rain
20/05/2022	2	14-16	10	Dry
23/05/2022	2	13-14	100	Showers
25/05/2022	3	17	100	Damp

BF = Beaufort Force: BF0 = calm, BF12 = hurricane force

2.3 Survey Constraints and Limitations

2.3.1 Conditions during the survey undertaken on 16th May 2022 were outside the optimum recommended survey conditions, with a recorded temperature of 18-20°C. However, as weather conditions were overcast with light rain, despite the high temperature the refugia did not heat up substantially. It is likely that conditions for reptiles at the refugia were therefore not substantially different to those during other surveys.

2.4 Ecological Evaluation Methodology

2.4.1 The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018)[3], which involves identifying 'important ecological features' within a defined geographical context (i.e. international, national, regional, county, district, local or site importance). Further detail is provided in Appendix 6322/2.

2.5 National Policy Approach to Biodiversity in the Planning System

2.5.1 National Planning Policy in Wales is set out in Planning Policy Wales (PPW)[4]. This describes policies designed to maximise environmental protection and limit environmental impact including the promotion of resilient biodiversity and ecosystems, citing biodiversity as an element in the delivery of distinctive and natural places, and ensuring environmental sustainability through good design.

2.5.2 PPW sets out a framework for the sustainable management of natural resources, which within which the planning system contribute by:

'• improving the resilience of ecosystems and ecological networks;

• halting and reversing the loss of biodiversity;

• maintaining and enhancing green infrastructure based on seeking multiple ecosystem benefits and solutions;' amongst other measures.

[3] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'*, ver. 1.1, Chartered Institute of Ecology and Environmental Management, Winchester

[4] Llywodraeth Cymru/Welsh Government (2021). *'Planning Policy Wales'*, Edition 11, February 2021.

2.5.3 PPW embeds the protection and enhancement of biodiversity within all components of the planning system in Wales, stating that:

'Biodiversity loss should be reversed, pollution reduced, environmental risks addressed and overall resilience of ecosystems improved.'

2.5.4 The approach to dealing with biodiversity in the context of planning applications is set out on Section 6.4, stating:

'The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.'

and

'Development plan strategies, policies and development proposals must consider the need to:

• support the conservation of biodiversity, in particular the conservation of wildlife and habitats;

• ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;

• ensure statutorily and non-statutorily designated sites are properly protected and managed;

• safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and

• secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.'

'All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission.'

2.5.5 PPW does not currently mandate a target for Biodiversity Net Gain, but does set out that:

'…development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity;'

'…planning decisions should incorporate measures which seek the creation, restoration and appropriate management of green networks and linkages between habitats and maintaining and enhancing other green infrastructure features and networks'.

2.5.6 The above approach encapsulates the 'mitigation hierarchy' described in British Standard BS 42020:2019[5], which involves the following step-wise process:

- **Avoidance –** avoiding adverse effects through good design;
- **Mitigation –** where it is unavoidable, mitigation measures should be employed to minimise adverse effects;
- **Compensation –** where residual effects remain after mitigation it may be necessary to provide compensation to offset any harm; and
- **Enhancement –** planning decisions often present the opportunity to deliver benefits for biodiversity, which can also be explored alongside the above measures to resolve potential adverse effects.

2.5.7 The measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development (BS 42020:2019, section 5.5).

2.6 Local Policy

2.6.1 The Local Policy for Cyngor Sir y Fflint Flintshire County Council is currently set out within the 'Flintshire Local Development Plan 2015 - 2030 (Adopted January 2023)'. Policies that relate specifically to ecology and biodiversity are set out below.

2.6.2 Policy EN2: Green Infrastructure

"Development proposals will be required to protect, maintain and enhance the extent, quality and connectivity of the green infrastructure network, including designated and non-designated green spaces (as shown on the proposals maps and listed in the table below), and where appropriate:

a. Create new green infrastructure linkages from the proposed development to the existing local network;

b. Fill in gaps in the existing network to improve connectivity.

Where the loss or damage of existing green infrastructure is unavoidable, appropriate mitigation and compensation will be required."

2.6.3 Policy EN3: Undeveloped Coast and Dee Estuary Corridor states:

"Within the undeveloped coast development will only be permitted where:

a. It can be demonstrated a coastal location is essential;

b. It conserves and enhances the open character of the coast;

c. It would not unacceptably harm areas of nature conservation, landscape or biodiversity;

d. It would not harm existing or proposed recreational or active travel routes;

e. Extensive coastal protection measures are not required; and

[5] British Standards Institution (2013) '*Biodiversity – Code of practice for planning and development*', BS 42020:2019

f. It would not be potentially at risk of flooding nor unacceptably increase erosion or flooding or interfere with natural coastal processes."

2.6.4 Policy EN6: Sites of Biodiversity and Geodiversity Importance states:

"Development will not be permitted that would result in an adverse effect on the integrity of sites of international nature conservation importance. Proposals where adverse effects on site integrity cannot be ruled out would not be supported.

Development likely to impact the special features of a Nationally Designated Site will only be granted in exceptional circumstances where appropriate compensation can be provided. Development proposals that would have a significant adverse effect on locally designated sites or site with other biodiversity and / or geological interest, including priority species, will only be permitted where:

a. it can be demonstrated that the need for the development outweighs the biodiversity or geological importance of the site; and

b. it can be demonstrated that the development cannot reasonably be located elsewhere; and

c. any unavoidable harm is minimised by effective mitigation to ensure that there is no reduction in the overall biodiversity value of the area. Where this is not feasible compensation measures designed to create, restore and enhance biodiversity must be provided.

Development that results in the restoration, enhancement and creation of habitats will be supported especially where this promotes the resilience of ecosystems."

2.6.5 Policy EN7: Development Affecting Trees, Woodlands and Hedgerows states:

"Development proposals that will result in significant loss of, or harm to, trees, woodlands or hedgerows of biodiversity, historic, and amenity value will not be permitted.

Where the impact of development affecting trees, woodlands or hedgerows is considered acceptable, development will only be permitted where:

a. the development maximises their retention through sensitive design

b. measures; and

c. where the removal of trees is considered necessary, suitable replacements

d. shall be provided elsewhere within the site; and

e. *it results in a net benefit in biodiversity."*

2.6.6 Policy EN7: Development In or Adjacent to Conservation Areas states:

"Development within or adjacent to a conservation area will only be permitted if it would preserve or enhance the character and appearance of the conservation area or its setting. New development in such locations must also be of a high standard of design, respond to the area's special characteristics, and pay particular regard to:

a. *important views, vistas, street scenes, roofscapes, trees, open spaces, gaps and other features that contribute to the character or appearance of the conservation area;*

b. *the retention of historically significant boundaries or other elements that contribute to the established form of development;*

c. *the relationship to existing buildings and spaces, and pattern of development;*

d. *scale, height and massing, architectural design and detailing, the use of materials, boundary treatment, and public realm materials."*

3 Reptiles

3.1 Legislation

3.1.1 All six species of British reptile are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), which protects individuals against intentional killing or injury. Sand Lizard *Lacerta agilis* and Smooth Snake *Coronella austriaca* receive additional protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (see Appendix 6322/2 for detailed provisions). All six reptile species are also S41 Priority Species.

3.2 Background Records

3.2.1 The desk study returned only one record of a reptile from within 2km of the site. This record, dating from 2013, was of a single Common Lizard *Zootoca vivipara* and was located at distance from the site.

3.3 Survey Results

3.3.1 No reptiles were recorded during any of the surveys undertaken at the site. It is therefore concluded that reptiles are likely to be absent from the site.

3.3.2 Survey forms recording each survey visit are provided in Appendix 6322/3.

3.4 Evaluation

3.4.1 The data obtained from the desk study and surveys indicates that reptiles are likely to be absent from the site. No further consideration of reptiles is required in relation to potential works at the site.

4 Summary

4.1.1 A desk study, habitat survey and surveys for reptiles have been carried out at the site.

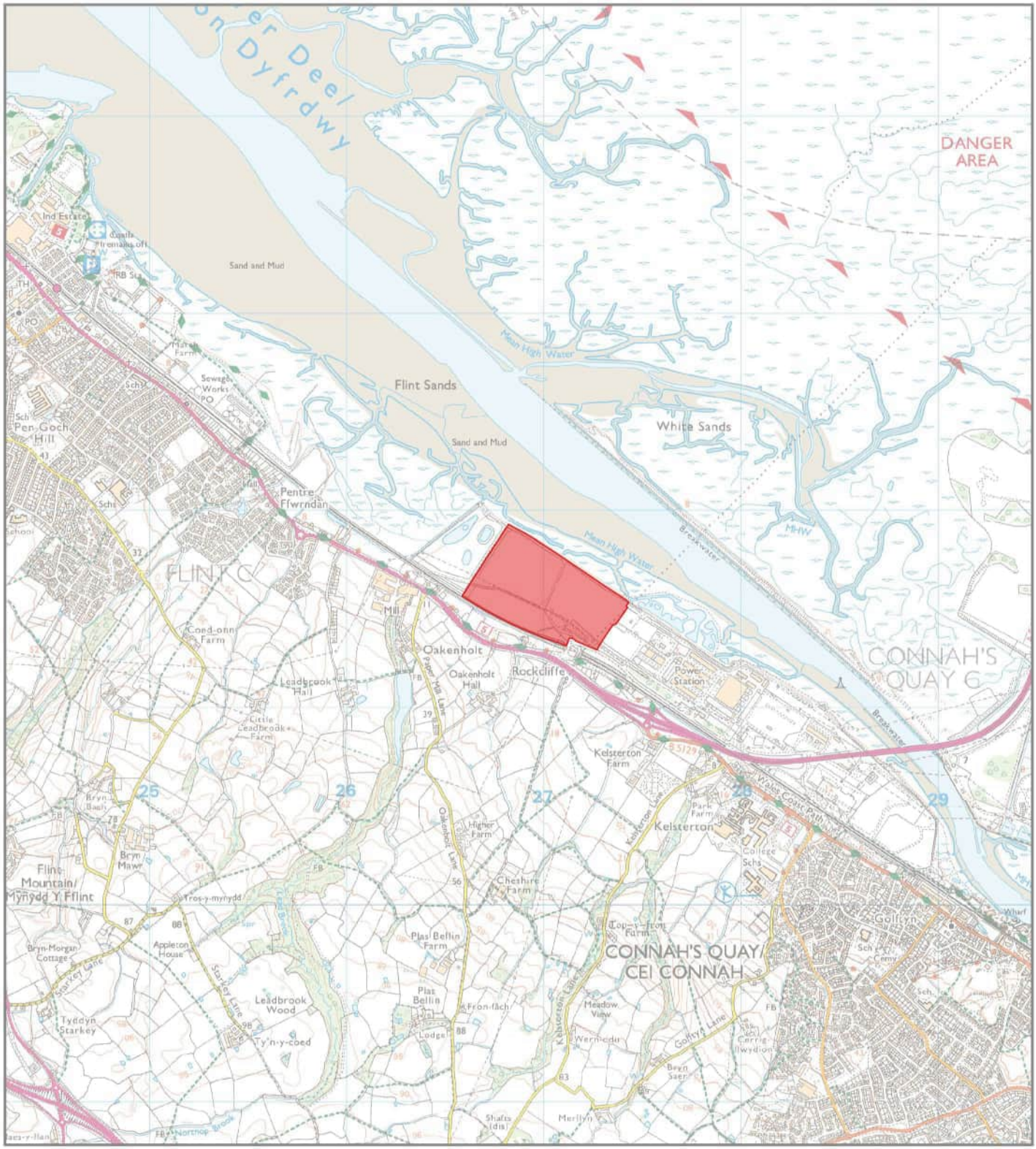
4.1.2 The desk study returned a single record of Common Lizard from within the 2km search area, and habitat with the potential to support reptiles was confirmed to be present within the site.

4.1.3 Surveys for reptiles undertaken in May 2022 found no reptiles to be present within the site.

4.1.4 It is concluded that reptiles are likely to be absent from the site. Reptiles are therefore not considered to be a constraint to any works that may be undertaken at the site.

Plan 6322/ECO1:

Site Location



Key:

Site Location

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Noral Way · Banbury · Oxfordshire · OX16 2AF
01295 279721 · info@aspect-ecology.com · www.aspect-ecology.com

Connah's Quay (North)	PROJECT
Site Location	TITLE
6322/ECO1	DRAWING NO.
B/JP	REV
September 2023	DATE

P:\Project\Aspect Ecology Projects\ECO 6300\1006322\Graphics\GIS\6322 - North ECO1 3.qgz

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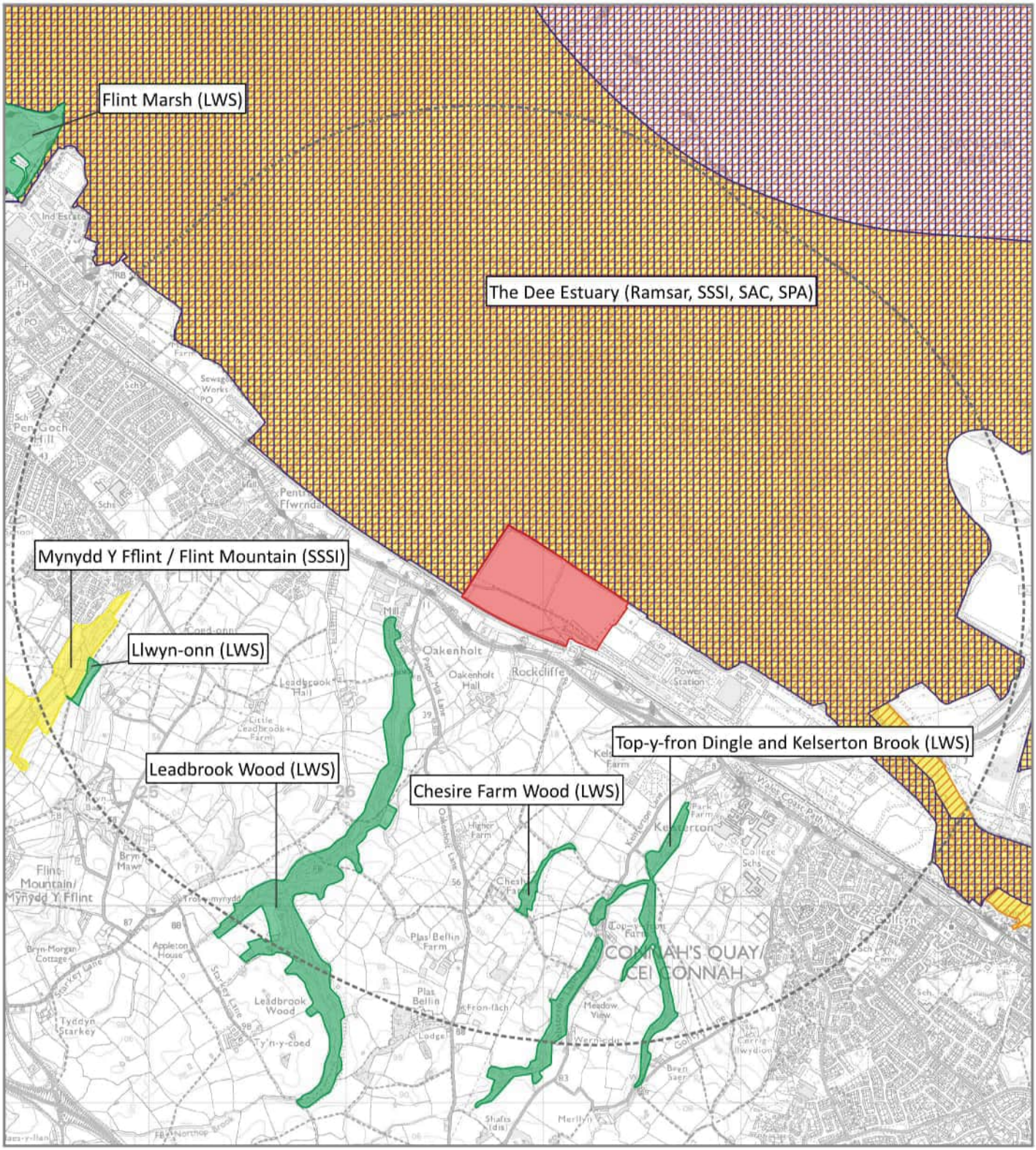
Plan 6322/ECO2:

Ecological Designations



Key:

- Site Location
- 2km Study Area
- Ramsar Site
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Local Wildlife Site (LWS)

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Connah's Quay (North)	PROJECT
Ecological Designations	TITLE
6322/ECO2	DRAWING NO.
B/JP	REV
September 2023	DATE

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Plan 6322/ECO3:

Habitats and Ecological Features

Key:

- Site Boundary
- Rough Grassland
- Improved Grassland
- Pasture
- Marshy Grassland
- Tall Ruderal Vegetation
- Scattered Scrub
- Dense Scrub
- Pond
- Reed Bed/Rush
- Hedgerow
- Tree Line
- Hardstanding

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Connah's Quay (North)	PROJECT
Habitats and Ecological Features	TITLE
6322/ECO3	DRAWING NO.
B/JP	REV
September 2023	DATE

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Plan 6322/ECO4:

Reptile Transect Locations

Key:

- Site Boundary
- Reptile Transect

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Connah's Quay (North)	PROJECT
Reptile Transect	TITLE
6322/ECO4	DRAWING NO.
B/JP	REV
September 2023	DATE

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Appendix 6322/1:

Evaluation Methodology

Evaluation Methodology

1. The evaluation of ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described by the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[1].

Importance of Ecological Features

2. Ecological features within the site/study area have been evaluated in terms of whether they qualify as 'important ecological features'. In this regard, CIEEM guidance states that *"it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable".*

3. Various characteristics contribute to the importance of ecological features, including:

- Naturalness;
- Animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- Ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity;
- Habitat connectivity and/or synergistic associations;
- Habitats and species in decline;
- Rich assemblages of plants and animals;
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

4. As an objective starting point for identifying important ecological features, European, national and local governments have identified sites, habitats and species which form a key focus for biodiversity conservation in the UK, supported by policy and legislation. These are summarised by CIEEM guidance as follows:

Designated Sites

- Statutory sites designated or classified under international conventions or European legislation, for example World Heritage Sites, Biosphere Reserves, Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA);

[1] CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*', Chartered Institute of Ecology and Environmental Management, Winchester

- Statutory sites designated under national legislation, for example Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
- Locally designated wildlife sites, e.g. Local Wildlife Sites (LWS).

Biodiversity Lists

- Habitats and species of principal importance for the conservation of biodiversity in England and Wales (largely drawn from UK BAP priority habitats and priority species), often referred to simply as Priority Habitats / Species;
- Local BAP priority species and habitats.

Red Listed, Rare, Legally Protected Species

- Species of conservation concern, Red Data Book (RDB) species;
- Birds of Conservation Concern;
- Nationally rare and nationally scarce species;
- Legally protected species.

5. In addition to this list, other features may be considered to be of importance on the basis of local rarity, where they enable effective conservation of other important features, or play a key functional role in the landscape.

<u>Assigning Level of Importance</u>

6. The importance of an ecological feature should then be considered within a defined geographical context. Based on CIEEM guidance, the following frame of reference is used:

- International (European);
- National;
- Regional;
- County;
- District;
- Local (e.g. Parish or Neighbourhood);
- Site (not of importance beyond the immediate context of the site).

7. Features of 'local' importance are those considered to be below a district level of importance, but are considered to appreciably enrich the nature conservation resource or are of elevated importance beyond the context of the site.

8. Where features are identified as 'important' based on the list of key sites, habitats and species set out above, but are very limited in extent or quality (in terms of habitat resource or species population) and do not appreciably contribute to the biodiversity interest beyond the context of the site, they are considered to be of 'site' importance.

9. In terms of assigning the level of importance, the following considerations are relevant:

Designated Sites

10. For designated sites, importance should reflect the geographical context of the designation (e.g. SAC/SPA/Ramsar sites are designated at the international level whereas SSSIs are designated at the national level). Consideration should be given to multiple designations as appropriate (where an area is subject to differing levels of nature conservation designations).

Habitats

11. In certain cases, the value of a habitat can be measured against known selection criteria, e.g. SAC selection criteria, 'Guidelines for the selection of biological SSSIs' and the Hedgerows Regulations 1997. However, for the majority of commonly encountered sites, the most relevant habitat evaluation will be at a more localised level and based on relevant factors such as antiquity, size, species-diversity, potential, naturalness, rarity, fragility and typicalness (Ratcliffe, 1977). The ability to restore or re-create the habitat is also an important consideration, for example in the case of ancient woodland.

12. Whether habitats are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Habitats of Principal Importance' or 'Priority Habitats', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular habitat under a BAP does not in itself imply any specific level of importance.

13. Habitat inventories (such as habitat mapping on the MAGIC database) or information relating to the status of particular habitats within a district, county or region can also assist in determining the appropriate scale at which a habitat is of importance.

Species

14. Deciding the importance of species populations should make use of existing criteria where available. For example, there are established criteria for defining nationally and internationally important populations of waterfowl. The scale within which importance is determined could also relate to a particular population, e.g. the breeding population of common toads within a suite of ponds or an otter population within a catchment.

15. When determining the importance of a species population, contextual information about distribution and abundance is fundamental, including trends based on historical records. For example, a species could be considered particularly important if it is rare and its population is in decline. With respect to rarity, this can apply across the geographic frame of reference and particular regard is given to populations where the UK holds a large or significant proportion of the international population of a species.

16. Whether species are listed as priorities for conservation at a national level in accordance with Sections 41 and 42 of the Natural Environment and Rural Communities Act (NERC) 2006, so called 'Species of Principal Importance' or 'Priority Species', or within regional or local Biodiversity Action Plans (BAPs) is also relevant, albeit the listing of a particular species under a BAP does not in itself imply any specific level of importance.

17. Species populations should also be considered in terms of the potential zone of influence of the proposals, i.e. if the entire species population within the site and surrounding area were to be affected by the proposed development, would this be of significance at a local, district, county or wider scale? This should also consider the foraging and territory ranges of individual species (e.g. bats roosting some distance from site may forage within site whereas other species such as invertebrates may be more sedentary).

Appendix 6322/2:

Legislation Summary

LEGISLATION SUMMARY

1. In England and Wales primary legislation is made by the UK Parliament, and in Scotland by the Scottish Parliament, in the form of Acts. The main piece of legislation relating to nature conservation in the UK is the Wildlife and Countryside Act 1981 (as amended).

2. Acts of Parliament confer powers on Ministers to make more detailed orders, rules or regulations by means of secondary legislation in the form of statutory instruments. Statutory instruments are used to provide the necessary detail that would be too complex to include in an Act itself[1]. The provisions of an Act of Parliament can also be enforced, amended or updated by secondary legislation.

3. In summary, the key pieces of legislation relating to nature conservation in the UK are:

    - Wildlife and Countryside Act 1981 (as amended)
    - Protection of Badgers Act 1992
    - Hedgerows Regulations 1997
    - Countryside and Rights of Way (CRoW) Act for England and Wales 2000
    - Natural Environment and Rural Communities Act 2006
    - Conservation of Habitats and Species Regulations 2017

4. A brief summary of the relevant legislation is provided below. The original Acts and instruments should be referred to for the full and most up to date text of the legislation.

5. **Wildlife and Countryside Act 1981 (as amended)**. The WCA Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) identified for their flora, fauna, geological or physiographical features. The Act contains strict measures for the protection and management of SSSIs.

6. The Act also refers to the treatment of UK wildlife including protected species listed under Schedules 1 (birds), 5 (mammals, herpetofauna, fish, invertebrates) and 8 (plants).

7. Under Section 1(1) of the Act, all wild birds are protected such that is an offence to intentionally:

    - Kill, injure or take any wild bird;
    - Take, damage or destroy the nest of any wild bird whilst in use* or being built;
    - Take or destroy an egg of any wild bird.

    * The nests of birds that re-use their nests as listed under Schedule ZA1, e.g. Golden Eagle, are protected against taking, damage or destruction irrespective of whether they are in use or not.

8. Offences in respect of Schedule 1 birds are subject to special, i.e. higher, penalties. Schedule 1 birds also receive greater protection such that it is an offence to intentionally or recklessly:

    - Disturb any wild bird included in Schedule 1 while it is building a nest or while it is in, on or near a nest containing eggs or young;
    - Disturb dependent young of such a bird.

[1] http://www.parliament.uk/business/bills-and-legislation/secondary-legislation/statutory-instruments/

9. Under Section 9(1) of the Act, it is an offence to:

- Intentionally kill, injure or take any wild animal included in Schedule 5.

10. In addition, under Section 9(4) it is an offence to intentionally or recklessly:

- Obstruct access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection; or
- Disturb any wild animal included in Schedule 5 while occupying a structure or place which it uses for that purpose.

11. Under Section 13(1) it is an offence:

- To intentionally pick, uproot or destroy any wild plant listed in Schedule 8; or
- Unless the authorised person, to intentionally uproot any wild plant not included in Schedule 8.

12. The Act also contains measures (S.14) for preventing the establishment of non-native species that may be detrimental to native wildlife, prohibiting the introduction into the wild of animals (releases or allows to escape) and plants (plants or causes to grow) listed under Schedule 9.

13. **Protection of Badgers Act 1992.** The Act aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. It should be noted that the legislation is not intended to prevent properly authorised development. Under the Act it is an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat* a Badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett# (this includes disturbing Badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

* the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence

\# A sett is defined as "*any structure or place which displays signs indicating current use by a Badger*". Natural England advice (June 2009) is that a sett is protected so long as such signs remain present, which in practice could potentially be for some time after the last actual occupation by Badger. Interference with a sett includes blocking tunnels or damaging the sett in any way

14. Licences can be obtained from the Statutory Nature Conservation Organisation (SNCO) for development activities that would otherwise be unlawful under the legislation, provided there is suitable justification. The SNCO for England is Natural England.

15. **Hedgerows Regulations 1997**. 'Important' hedgerows (as defined by the Regulations) are protected from removal (up-rooting or otherwise destroying). Various criteria specified in the Regulations are employed to identify 'important' hedgerows for wildlife, landscape or historical reasons.

16. **Countryside and Rights of Way (CRoW) Act for England and Wales 2000.** The CRoW Act provides increased measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation. Schedule 12 of the Act amends the species provisions of the WCA 1981, strengthening the legal protection for threatened species. The Act also introduced a duty on Government to have regard to the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

17. **Natural Environment and Rural Communities Act 2006.** Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as local planning authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when exercising their normal functions. 56 habitats and 943 species of principal importance are included on the S41 list. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan (BAP).

18. **Conservation of Habitats and Species Regulations 2017 (as amended).** The Regulations enact the European Union's Habitats Directive (92/43/EEC) in the UK. The Habitats Directive was designed to contribute to the maintenance of biodiversity within member states through the conservation of sites, known in the UK as Special Areas of Conservation (SACs), containing habitats and species selected as being of EC importance (as listed in Annexes I and II of the Habitats Directive respectively). Member states are required to take measures to maintain or restore these natural and semi-natural habitats and wild species at a favourable conservation status.

19. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs)[2] classified under Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). These sites constitute the Natura 2000 network. The Regulations impose restrictions on planning decisions likely to significantly affect SPAs or SACs.

20. The Regulations also provide protection to European Protected Species of animals that largely overlaps with the WCA 1981, albeit the provisions are generally stricter. Under Regulation 43 it is an offence, *inter alia*, to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species;
- Deliberately disturb any wild animals of any such species, including in particular any disturbance likely to impair their ability to survive, to breed or reproduce, to rear or nurture their young, to hibernate or migrate, or which is likely to affect significantly their local distribution or abundance;
- Deliberately take or destroy the eggs of such an animal;
- Damage or destroy a breeding site or resting place of such an animal.

21. Similar protection is afforded to European Protected Species of plants, as detailed under Regulation 47.

22. The Regulations do provide a licensing system that permits otherwise illegal activities in relation to European Protected Species, subject to certain tests being fulfilled.

[2] Special Protection Areas (SPAs) are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC) (aka the Birds Directive), which came into force in April 1979. SPAs are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.

Appendix 6322/3:

Survey Data

ECO & Project	6322 CONNAH'S QUAY NORTH
Date and Time	6/5/22 12-15
Surveyors	AN + CW
Tin Temperture(s)	Warm
Weather and Other Info	Start Temp °C: 16 / End Temp °C: 17 / Cloud Cover %: 0% / Beaufort: 3 / Rain: NONE

Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*

Other info: 12 mph NE winds

Transect	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif?
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile			
	Male	Female		Male	Female		Male	Female				
A												
B												
C												
D												
E												
F												
G												
H												
I												
J												
K												
L												
M												
N												
O												
P												
Q												
R												
S												
T												
U												
V												
W												
X												
Y												
Z												
TOTAL												

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

ECO & Project	6322 Comedy's Quay North					Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*
Date and Time	9/5/22 11 am					Cool
Surveyors	LP/AC					
Tin Temperture(s)						Other info
Weather and Other Info	Start Temp °C: 16	End Temp °C: 16	Cloud Cover %: 75	Beaufort: 3	Rain: Dry	

Transect	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif? ✓
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile			
	Male	Female		Male	Female		Male	Female				
A ✓												
B ✓												
C ✓												
D ✓												
E ✓												
F ✓												
G ✓												
H ✓												
I ✓												
J ✓												
K ✓												
L ✓												
M ✓												
N												
O												
P												
Q												
R												
S												
T												
U												
V												
W												
X												
Y												
Z												
TOTAL												

Nothing found

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

ECO & Project	6322 Connah's Quay North					Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*
Date and Time	12/05/22 11.30					
Surveyors	MW + AN					
Tin Temperture(s)						Other info
Weather and Other Info	Start Temp °C: 14	End Temp °C: 16	Cloud Cover %: 65	Beaufort: 3	Rain: Dry	

Transect	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif? Yes
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile			
	Male	Female		Male	Female		Male	Female				
A ✓												
B ✓												
C ✓												
D ✓												
E ✓												
F ✓												
G ✓												
H ✓												
I ✓												
J ✓												
K ✓												
L ✓												
M ✓												
N												
O												
P												
Q												
R												
S												
T												
U												
V												
W												
X												
Y												
Z												
TOTAL												

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

ECO & Project	6322 Conrad's Quay North					Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*
Date and Time	16/05/22 12.00 pm					
Surveyors	[redacted]					
Tin Temperture(s)	Warm					Other info
Weather and Other Info	Start Temp °C: 18	End Temp °C: 20	Cloud Cover %: 100	Beaufort: 3	Rain: Light rain	

Transect	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif? ✓
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile			
	Male	Female		Male	Female		Male	Female				
✓												
✓B												
✓C												
✓D												
✓E												
✓F												
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U												
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W												
X												
Y												
Z												
TOTAL												

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

ECO & Project	Connah's away 6322 North					Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*
Date and Time	10 am 20/05/22					
Surveyors	MH					
Tin Temperture(s)	Cool - Warm					Other info
Weather and Other Info	Start Temp °C: 14	End Temp °C: 16	Cloud Cover %: 10	Beaufort: 2	Rain: N	

	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif?	✓
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile				
Transect	Male	Female		Male	Female		Male	Female					
X A													
X B													
X C													
X D													
X E													
X F													
X G													
X H													
X I													
X J													
X K													
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U													
V													
W													
X													
Y													
Z													
TOTAL													

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

ECO & Project	6322 – Connah's Quay North				Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*
Date and Time	11.30 23/05/22				
Surveyors	AN				
Tin Temperture(s)	Cool				Other info
Weather and Other Info	Start Temp °C: 13	End Temp °C: 14	Cloud Cover %: 100	Beaufort: 2	Rain: Showers

Transect	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif? Yes
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile			
	Male	Female		Male	Female		Male	Female				
✓A											Common Toad	
✓B												
✓C												
✓D												
✓E												
✓F												
✓G												
✓H												
✓I												
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W												
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Y												
Z												
TOTAL												

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

ECO & Project	6322 Connah's Quay North					Tin temperature relates to the warmth of the tins to touch – i.e cold, cool, warm or hot. Note that some tins may be different temperatures to others so on the form you could record for example *cool – warm*
Date and Time	25/5/22 – 12.30					
Surveyors	[redacted]					
Tin Temperture(s)	Cool					Other info
Weather and Other Info	Start Temp °C: 17	End Temp °C: 17	Cloud Cover %: 100	Beaufort: 3	Rain: Damp	

Transect	Common Lizard			Slow Worm			Grass Snake			Other Reptiles	Other species	Have you read the H&S breif? ✓
	Adults		Juvenile	Adults		Juvenile	Adults		Juvenile			
	Male	Female		Male	Female		Male	Female				
A												
B												
C												
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W												
X												
Y												
Z												
TOTAL												

NO REPTILES FOUND

Comments

PLEASE NOTE THE ROUGH LOCATION OF ANY REPTILES FOUND ON THE TIN LOCATION PLAN

Beaufort Scale: 0-smoke rises vertically 1-Wind motion visible in smoke 2-Wind felt on exposed skin 3-Leaves and smaller twigs in constant motion 4-Small branches begin to move 5-Smaller trees sway 6-Large trees in motion, whistling heard in overhead wires 7-Whole trees in motion, some difficulty when walking into wind 8-Twigs broken from trees, cars veer on road 9-Light structural damage 10-Trees uprooted, considerable structural damage 11-Widespread structural damage 12-Considerable and widespread destruction to structures.

Rain: Dry, light rain, showers, heavy shower, misty etc. Please make a note of the rains start and stop time.

Appendix C Gazetteer

Connah’s Quay Low Carbon Power

Scoping Report Appendix C

Document Reference 60717119

Uniper

Delivering a better world

Prepared for:

Uniper

Prepared by:

AECOM Limited

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Appendix C Gazetteer

Table 1 1 km Study Area Gazetteer

Ref	Grid Reference	Period	Designation	Description
FL180	327755 370587	Post-Medieval	Scheduled monument	Kelsterton Brewery, remains of a 19th century industrial building. Kelsterton Brewery consists of a very large ale and porter brewery, which was the first of the kind established in this county, and was erected in the hamlet of Kelsterton, in the year 1818. The impressive remains of vaulted under-crofts, double-skinned stone tanks, and of a weir and associated works survive.
FL213	325877 371763	Roman	Scheduled monument	Croes Atti Roman Site. The monument comprises the buried remains of a Roman road, roadside settlement and associated cremation cemetery known from geophysical survey and archaeological evaluation (Wardell Armstrong 2014, 2015). This lies on the continuation of the same Roman road and an associated roadside lead working and domestic complex excavated approximately 80 m to the NNW in 2013.
FL131	325486 372085	Roman	Scheduled monument	Pentre Bridge Roman Site. A Roman settlement site.
1	SJ 27836 70714	Post-Medieval	Grade II listed building	Kelsterton Hall, Circa 1800. A large two storeyed house of red brick with stone dressings. Of three bays, the sides advanced and the recess built-up to second storey floor level with later stone pilastered colonnade, now filled in with modern glazing and roofed with glass.
355	SJ 26667 71055	Post-Medieval	Grade II listed building	Oakenholt Hall, a three storey, three window country house, of stucco with a roof behind parapet. Second floor has three six-pane hornless sash windows. First floor has three 16-pane hornless sash windows. On ground floor, central doorway under flat-roofed Doric porch. Dated sill states "JSMW 1808".
521	SJ 26680 71034	Post-Medieval	Grade II listed building	Oakenholt Farmhouse, comprising two storeys, with modern cement rendered, modern glazing, and a slate roof. Origins of a 17th century or earlier timber-framed cruck building faced in stone 18/19th century.
16408	SJ 24301 70393	Post-Medieval	Grade II listed building	Waen Farmhouse, a probably 17th century farmhouse. Two storeys, rubble with raking gable parapets with ball finials, brick chimney towards centre.

Ref	Grid Reference	Period	Designation	Description
16409	SJ 26013 71035	Post-Medieval	Grade II listed building	Leadbrook Hall. A 17th century & 18th century farmhouse. Consists of two blocks, large three-storey block in brick (on stone plinth), cement rendered to north and west, slate roof, raking gable parapets, pressed red brick chimneys
85254	SJ 29078 69885	Post-Medieval	Grade II listed building	Church of St Mark dated 1836, consisting of a nave, chancel, W tower incorporating porch, SE vestry and NW choir vestry. Constructed of dressed yellow sandstone, the chancel later and of snecked sandstone, under slate roofs.
85255	SJ 29401 69896	Post-Medieval	Grade II listed building	Dock Basin, a large, 19th century three-sided dock basin, the fourth side open to the Dee Estuary. The three sides are lined by large blocks of snecked stone with flat stone copings, continuing as flagstone paving to the south side.
85257	SJ 29337 69879	Post-Medieval	Grade II listed building	Former Barn, Old Quay House Inn, built c. 1777. Symmetrical three-bay lofted range constructed of coursed blocks of yellow sandstone under an old slate roof. Dressed sandstone quoins with moulded kneelers and raised stone copings.
85258	SJ 29035 69859	Post-Medieval	Grade II listed building	Former Stable Block & attached boundary walls, c. 1839-41. An L-shaped lofted block with coach-house, stables and accommodation. Constructed of brick, white-washed to front, with dentilled eaves. Slate roof, hipped to north end and south-west angle, with raised stone copings to east gable end.
85260	SJ 29071 69907	Modern	Grade II listed building	Lychgate at Church of St Mark, built 1917. Side walls and front piers of snecked yellow sandstone with chamfered stone copings, supporting a timber-framed superstructure, the timbers pegged. Swept gabled slate-covered roof surmounted by a crucifix.
85262	SJ 29341 69894	Post-Medieval	Grade II listed building	Old Quay House Inn, dated 1777. A two-storey four-window range, rendered and white-washed over brick under a slate roof with tile cresting; four tall brick ridge stacks with distinctive corbelled caps, two towards each end.
85264	SJ 29562 69609	Post-Medieval	Grade II listed building	The Ship Public House, recorded on 1870 OS map. Three-window, two-storey, constructed of brick, the façade half-timbered to the upper storey, under a red-tiled roof; brick end stacks set forward. The timber-framed and jettied upper storey is symmetrical, with ornamental box-panelling containing quadrant circle decoration.
85265	SJ 29052 69850	Post-Medieval	Grade II listed building	The Vicarage, built 1839-41. Symmetrical three-window two-storey vicarage; roughcast and white-washed under a hipped slate roof with two red brick ridge stacks. Wide boarded eaves and stone plinth. Central entrance containing a half-glazed panelled door with three-pane overlight inside a wide glazed porch.

Table 2 5 km Study Area Gazetteer

Ref	Grid Reference	Period	Designation	Description
FL064	323814 371425	Medieval	Scheduled monument	Bryn y Cwm Mound & Bailey Castle. The monument comprises the remains of a motte and bailey castle, a military stronghold built during the medieval period. The motte is roughly circular and stands to a height of 30 ft with a flattened top, which measures 90 ft in diameter. The ditch on west side rises 15 ft to the counterscarp and on the south side of motte, a spur of high ground runs south. This is separated from the field to the west by the ditch which measures 15 ft deep with a small stream at the bottom, and from the field to the east by a wide ditch rising 10 ft to field boundary.
FL003	324694 373286	Medieval	Scheduled monument	Castell y Fflint. This monument comprises the remains of a medieval castle begun in 1277 by King Edward I. The castle is located on the foreshore of the Dee estuary, dominating the river and the route along the coastal plain. The castle consists of a square ward with a round tower at each corner. Notably, the south-eastern tower (Great Tower) is much bigger and offset from the main courtyard by a moat which probably contained sea water at high tide, and was crossed by a drawbridge. This highly sophisticated separate tower or donjon has a strong barrel-vaulted circular gallery at basement level, surrounding a central space and supporting a ring of small interconnecting rooms on the floor above. It probably contained all the facilities necessary to withstand a siege (storerooms, well, residential accommodation, chapel) many of them duplicated in the courtyard, and was effectively a castle within the castle. Notably, this unique tower design has no known exact parallel in Britain or the Continent.
FL002	328806 367519	Medieval	Scheduled monument	Castell Ewloe. This monument comprises the remains of a medieval castle built around 1257 by Llywelyn ap Gruffudd. Located in dense woodland which in medieval times was part of the great forest of Ewloe, it commands a north-facing slope above two ravines, but is overlooked on the south, where a substantial earthwork has been built outside the moat.
FL023	323680 369354	Medieval	Scheduled monument	Llys Edwin Medieval Fortified House Site. The moated area of Llys Edwin measures 58 m north-east to south-west by 54 m. In 1931 excavation indicated a multiphase moated house, focussed on the northern quadrant. A possible fishpond, c. 86 m by 18 m is aligned with the south-west arm of the moat, and earthworks in the north-east may indicate the presence of a formal garden. Finds indicate late thirteenth to early fourteenth century occupation.
FL082	323232 369327	Early Medieval	Scheduled monument	Wat's Dyke: Section from Coed Llys to Chester-Holywell Road. An early historic boundary marker probably associated with the border of the kingdom of Mercia. Both Offa's Dyke and

Ref	Grid Reference	Period	Designation	Description
				Wat's Dyke probably represent separate attempts in the 8th century to formalise the boundary between the early historic kingdoms within Wales and Mercia to the east. Wat's Dyke runs south from Holywell to the Morda Valley near Maesbury. For the most part, Wat's dyke consists of an earthen bank, often utilising local topography and fronted, where it survives, by a ditch to the west.
FL083	323406 368179	Early Medieval	Scheduled monument	Wat's Dyke: Section from Chester-Holywell Road to Soughton Farm, an early historic boundary marker probably associated with the border of the kingdom of Mercia. Both Offa's Dyke and Wat's Dyke probably represent separate attempts in the 8th century to formalise the boundary between the early historic kingdoms within Wales and Mercia to the east. Wat's Dyke runs south from Holywell to the Morda Valley near Maesbury. For the most part, Wat's dyke consists of an earthen bank, often utilising local topography and fronted, where it survives, by a ditch to the west. The size of the surviving earthworks varies considerably, reflecting differences in preservation and probably also in the original scale of construction.
FL084	324327 366969	Early Medieval	Scheduled monument	Wat's Dyke: Section SE of Clawdd Offa. The monument consists of the remains of a length of Offa’s Dyke, a presumed 8th century AD defensive bank and ditch. It consists of a stretch of bank, with a ditch on the western side. A counterscarp (raised bank) may be visible on the west side of the ditch in places.
FL085	325217 365827	Early Medieval	Scheduled monument	Wat's Dyke: Section north and east of New Brighton.
FL061	322428 373540	Medieval	Scheduled monument	Bryn Castell Castle Mound. The motte stands to a height of 18 ft and has a flattened top with a diameter of 25 ft. There is a large hole cut into the top of the motte, measuring 7 ft deep, which is continued as a trench down the west side.
FL062	322138 373436	Medieval	Scheduled monument	Hen Blas Castle Site. The monument consists of the remains of a castle, dating to the medieval period. A castle is a defended residence or stronghold, built mainly of stone, in which the principal or sole defence comprises the walls and towers bounding the site. The monument consists of the remains of an enclosure approximately 48 m north-south by 50 m east-west sited on a spur-end between two streams flowing from west to east. The enclosure is defined by a ditch on the west and elsewhere by steep natural slopes. On the west is an outer enclosure 72 m north-south by 78 m, again ditched on the west. There is mention of a castle being built in this location in 1157 and captured in 1166. Excavations concluded in 1957 demonstrated that an earthwork castle was replaced by a fortified manor house in the early thirteenth century which was itself abandoned in the late fourteenth century.

Ref	Grid Reference	Period	Designation	Description
FL179	321165 372204	Medieval	Scheduled monument	Hafod Wood Moated Site, the monument comprises the remains of a well-preserved medieval moated homestead. It comprises a rectangular moated site, c. 23 m square within a moat c. 8 m wide and counterscarp bank c. 2 m wide. The site is in excellent condition; the moat platform is fairly level with no signs of disturbance, while the moat is waterlogged in places and therefore has good potential for organic remains. There is no clear entrance. A circular feature in the south-west corner may be an earlier pond or quarry.
FL011	321117 369036	Iron Age	Scheduled monument	Moel y Gaer Camp comprises the remains of a defended enclosure or hillfort. Such monuments probably date to the Iron Age period (c. 800 BC - AD 74), although several are known to date from the Late Bronze Age with activity through to the early post-Roman period. Moel y Gaer is a sub-oval hilltop enclosure, measuring about 190 m north-south by 130 m to 170 m. It is generally defined by a bank, ditch and counterscarp, but there is some variation, notably about the east-facing entrance. Excavations in 1972-3, in advance of the construction of the reservoir, revealed a complex late Bronze Age and early Iron Age sequence of construction and occupation. The site encompasses a tumulus on the summit of the hilltop.
FL030	331262 365975	Medieval	Scheduled monument	Trueman's Hill motte, the monument comprises the remains of a medieval motte, an earthen mound upon which a fortification once stood.
FL166	327519 365526	Post-Medieval	Scheduled monument	Pinfold Lane Pottery, Site of, the monument consists of the remains of a pottery kiln. The earthwork remains of one of the earliest potteries so far located at Buckley. Trial excavations in 1972/74 revealed a working floor and pan. Finds recovered date from the late 17th century to the mid-eighth century.
1013298	SJ 30336 73568	Iron Age	Scheduled monument	Promontory fort on Burton Point 550 m south-west of Burton Point Farm. The monument includes a promontory fort formed by a single bank and external ditch which cuts off a small promontory known as Burton Point overlooking the estuary of the River Dee on the south west coast of the Wirral. The single rampart stands up to 5m high and is 12m wide at the base. It curves around to form a 50 degree angle for 68m and encloses a triangular tip of the promontory. The external ditch is 2m deep. Both ends of the defences have been truncated by erosion and quarrying.
1007635	SJ 30180 74657	Medieval	Scheduled monument	St Andrew's medieval hospital and limekiln, Denhall. The monument is the medieval hospital of St Andrew, located in Chapel Field at Denhall and founded c.1231-4 for the help of the poor, shipwrecked, and travellers to and from Ireland. It is situated at the foot of a west-facing slope a short distance above the shoreline of the River Dee and includes earthwork remains of the ruined buildings of the hospital complex and precinct wall.

Ref	Grid Reference	Period	Designation	Description
1011785	SJ 33595 72022	Medieval	Scheduled monument	Shotwick Hall moated site. The monument comprises the moated site of the original Shotwick Hall and includes an island and moat occupied by a coppice known as Moat Plantation. The island measures c. 25 m x 32 m, is raised c. 0.5 m above the level of the surrounding fields, and is occupied by established trees and newly planted saplings. Surrounding the island is a largely silted moat c.10 m wide x 1.5 m deep vegetated with grass, nettles and some scrub.
1016918	SJ 31407 74061	Post-Medieval	Scheduled monument	Icehouse 110 m south-west of Burton Manor College main building. The monument includes an icehouse with a food preparation chamber attached in the grounds of Burton Manor College. The icehouse is approached by two sets of stairs leading down into the entrance passage on the south side, constructed of drystone walling and revetted back to the stone built entrance archway which is mortared, There is a second entrance on the north side, leading directly into the ice chamber. This consists of a revetted sunken way leading down from the garden. The southern chamber has an entrance passage 1.8 m long, 1.25 m wide and 2 m high. This opens onto a rock cut chamber with a stone vaulted roof. This is 5 m long, 3.5 m wide and 1.3 m high.
PGW(C)25(FLT)	324696 367536	Post-Medieval	Grade II* registered park and garden	Soughton Hall is located on the immediate south side of the village of Northop. It is registered for its well-preserved early eighteenth-century parkland planting and for the contemporary lime avenue that flanks the drive approaching the house. There is important group value with the Grade II* Listed early eighteenth-century house (LB 547), coach house range and stable block (LBs 549-50), and garden walls with turrets (LB 548), together with the Grade II Listed game larder and garden well head (LBs 551 & 25684). The park is a medium-sized landscape park on gently undulating ground. It is roughly rectangular on plan, bounded on the north by the B5126, on the west by the A5149, on the east by an old track and a local golf course, and on the south by a minor road. Most of the park dates from the eighteenth century, as is much of the planting, though earlier planting is evident. Dense planting on the west side of the park shielded the property from the A5119. The park surrounds entirely Lower Soughton Hall to the north (PGW(C)18(FLT).
PGW(C)43(FLT)	322952 366371	Post-Medieval	Grade II* registered park and garden	Gwysaney is located on the edge of a plateau to the north of Mold. It is registered for the historical interest of its park which has origins as a seventeenth-century deer park with some contemporary walling and trees; also for its fine nineteenth-century arboretum containing many unusual mature specimens, and for the Victorian/Edwardian layout of its garden. There is also important group value with the Grade II* Listed Gwysaney Hall (LB 14885), the Grade II Listed Gwysaney Lodge and gate piers (LBs 26173-4), and several other Grade II Listed buildings and garden features around the Hall and estate.

Ref	Grid Reference	Period	Designation	Description
				The park, first mentioned in 1664, lies between the Mold-Rhydymwyn road on the south (A541) and the house to the north, on rolling ground sloping up from south to north. It is rectangular, aligned north by south, but was formerly more extensive on the east, west and north; about two thirds of the historic park is now farmland. The remainder is pasture with isolated mature trees, mainly oak, but with some lime and very ancient sweet chestnut. The drive, formerly flanked by sweet chestnuts, approaches from the main entrance and lodge on the A541 to the higher, more level ground to the south of the house. Just east of the drive, in the middle of the park, is an evergreen oak.
3	SJ 31704 66275	Post-Medieval	Grade I listed building	St Deiniols Ash, a large timber-framed and brick house of two main periods. Storeyed central timber-framed range, probably third quarter 16th century, to which a tall parlour wing, garderobe tower and porch were added in the early 17th century
13	SJ 28819 67523	Medieval	Grade I listed building	Ewloe Castle, situated in a wood overlooking the Wepre Brook. A native Welsh castle, small in scale, though occupying a commanding site at the confluence of two streams and with a steep drop to the north. The castle is overlooked by higher ground to the south and this side is therefore the focus of the defences. Large ditches to this and the east sides. The castle is in two sections, with a large D-shaped keep known as the "Welsh Tower" in a walled upper ward at the east.
321	SJ 24637 68486	Medieval	Grade I listed building	Church of St Eurgain and St Peter. A medieval Church in Perpendicular style with W Tower, nave and chancel in one, N aisle. The Perpendicular tower is constructed of fine coursed sandstone ashlar. It is five-stage with full-height diagonal buttresses with offsets, a plinth and string courses between stages, all with moulded copings.
542	SJ 20917 71169	Post-Medieval	Grade I listed building	Church of St Mary, built 1877-8 by John Douglas, architect of Chester. Early Decorated style church comprising nave with a north aisle and south porch, a slightly lower and narrower chancel, and north-east tower.
15025	SJ 31451 65919	Post-Medieval	Grade I listed building	St Deiniol's Library. The library was founded by W.E. Gladstone in 1890. Roughly H-plan and conceived as Jacobethan in design and as late Perpendicular in detail. Of red sandstone under a medium-pitched slate roof.
16403	SJ 24708 73344	Medieval	Grade I listed building	Flint Castle including Revetment Wall of Ditch. First of castles built by Edward I during his conquest of North Wales. Ruinous. Brown, yellow, and red stone, quarried from site, and across Dee on Wirral. Inner bailey consists of almost square enclosure with sides of approximately 50 m (east-west) by 40 m (north-south), and corner towers. Medieval curtain wall survives to the south, and at the north-west corner

Ref	Grid Reference	Period	Designation	Description
1145903	SJ 33679 71771	Medieval	Grade I listed building	Church of St Michael. It has a late 11th century door, body of church 14th century, late Perpendicular tower, south porch and some fenestration of 17th century. Restoration in 1851. Ashlar red sandstone, with purple tile roof except for Welsh slated chancel and porch.
12	SJ 31545 65918	Medieval	Grade II* listed building	Parish Church of St Deinol, a mid-14th century, late Decorated church with earlier origins. This was restored by James Harrison c. 1855-6 but was largely gutted by fire in 1857. The church was restored in Decorated style by Sir Gilbert Scott of London and was completed in 1859.
23	SJ 30919 67029	Medieval/ Post-Medieval	Grade II* listed building	Aston Hall, home of the Whitley family since the 14th century. The present house H plan and probably early-mid 16th century, though reduced and much altered in the early 19th century, to which period its external appearance now belongs. The present entrance front (south-west) is near symmetrical and of three bays. Medium-pitched slate roof with plain rendered end-chimneys and brick dentilated eaves. Of brick, roughcast-rendered with painted stucco quoins and plinth.
55	SJ 27344 69845	Post-Medieval	Grade II* listed building	Top y Fron Hall, an early-18th century hall, said to be one of the earliest brick houses in Flintshire. Some of the internal features are of the 1760s. Early Georgian double-pile three-storey house, constructed of brick under slate roofs with two brick stacks between roof spans. Detail includes continuous parapets with stone copings, shallow quoin strips and flush sash windows with cambered brick heads and brick sills.
323	SJ 26802 68436	Medieval	Grade II* listed building	Northop Hall Farm (Llaneurgain), a former gentry house, now farmhouse. Said to have been built in mid-15th century. House in yellow stone and red brick, roof covering lost in fire of 1995, brick chimneys.
326	SJ 22682 70250	Post-Medieval	Grade II* listed building	Coed-y-cra Uchaf, a two-storey rubble-stone house with mullioned windows, slate roof behind coped gables, and with central stone ridge stack. The origin of the present house is a 16th century timber-framed hall house altered in successive phases.
547	SJ 24819 67354	Post-Medieval	Grade II* listed building	Soughton Hall. The present house was first built c. 1727 for the Conway family and was Baroque in style. Wide symmetrical south front with four-storey end towers, three-storey linking bays to recessed two-storey three-bay centre with Italianate detailing. Red brick with sandstone dressings.
548	SJ 24839 67313	Post-Medieval	Grade II* listed building	Garden Walls, Corner Turrets, Gates and Gate Piers at Soughton Hall. Formal rectangular south garden in front of house enclosed by tall red brick walls with stone cappings. Pair of square panelled monolithic gatepiers to centre (aligned with main avenue), on plinths and

Ref	Grid Reference	Period	Designation	Description
				with moulded capstones supporting tall urns. Between them are double wrought iron gates with dog rails, top rails swept down to centre, and spear finials.
549	SJ 24802 67261	Post-Medieval	Grade II* listed building	Stable Block at Soughton Hall. Large square two-storey block constructed of brick with freestone dressings under double-pitched hipped slate roofs, and with tall brick stacks asymmetrically arranged. Detail includes banded angle pilasters, stone plinth and deep moulded eaves cornice. Early Georgian stable block, said to retain Bankes heraldry so probably mid-18th century. The stable block is now a restaurant.
550	SJ 24783 67268	Post-Medieval	Grade II* listed building	Coach-house Range at Soughton Hall. An early Georgian coach-house, comprising square block in red brick with freestone dressings including banded quoins. Two-storey three-bay front with pediment facing east. Parapets behind pediment and complex hipped slate roof, formerly surmounted by a glazed lantern containing a pigeon loft.
592	SJ 24416 68252	Post-Medieval	Grade II* listed building	Parkgate Farm Farmhouse and attached Shippon. Tall L-plan farmhouse in simple Gothic style, of two storeys and attics with rear ranges linking with shippon at right angles. Constructed of local rubble with freestone dressings under steeply pitched slate roofs with stone stacks and wide boarded eaves. Built c. 1863 by the Soughton estate, and shown on the 1st edition Ordnance Survey of 1870.
14885	SJ 22766 66452	Post-Medieval	Grade II* listed building	Gwysaney, a large Jacobean house facing south, comprising the original house on the right side, with the main service wing of 1863-5 to its left, and a further west service wing of c. 1906 at the left end.
17792	SJ 20945 70916	Post-Medieval	Grade II* listed building	Halkyn Castle and attached Stable Block a 19th century castellated style mansion of two and three storeys with turrets, towers, many stacks; of buff ashlar and chiefly mullioned and transomed windows under hood moulds.
19185	SJ 24489 68368	Post-Medieval	Grade II* listed building	Plymouth House and adjoining Coach-house, a large house of two storeys and attics with symmetrical Renaissance-style plan; central block with gabled wings advanced to front.
24440	SJ 24666 68518	Post-Medieval	Grade II* listed building	Grammar School, built c. 1608. Single range orientated north-south. Two-storey three-window front facing west, constructed of rubble sandstone under a slate roof.
1115567	SJ 32618 73314	Medieval/ Post-Medieval	Grade II* listed building	Puddington old hall, priests house and priests house flat. Formerly moated manor house, now two houses and a flat: two wings late 15th century and one wing early 16th century for the Massey family. Rewalling of early 18th century and some additions dated 1909. Timber framed, outer walls are brick clad, and roughcast. Welsh slate roof with stone ridge, mixture of lateral and ridge brick chimneys.

Ref	Grid Reference	Period	Designation	Description
1387811	SJ 31723 74343	Medieval	Grade II* listed building	Church of St Nicholas, 12th century and 14th century; re-ordered 1721 on datestone over south door; restoration and chancel rebuilt 1870. Built of coursed red sandstone; grey slate roofs with stone coped gables and sandstone ridges. Comprises a continuous nave and chancel; north aisle, continuous chapel and north vestry; west tower.

Appendix D Long List of 'Other Developments'

AECOM

Connah's Quay Low Carbon Power

Scoping Report Appendix D

Document Reference 60717119

Uniper

Delivering a better world

Prepared for:

Uniper

Prepared by:

AECOM Limited

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Appendix D Long List of 'Other Schemes'

Table 1 Long list of development initially considered for cumulative impact assessment

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
1	HyNet Carbon Dioxide Pipeline	Planning Inspectorate	A new build carbon dioxide (CO_2) pipeline that will transport CO_2 produced and captured by future hydrogen producing facilities and existing industrial premises in North West England and North Wales for offshore storage. The CO_2 pipeline will comprise both newbuild and existing pipelines [and newbuild and existing above-ground installations (AGI) to allow operation and maintenance works in relation to the pipeline, including the newbuild Proposed Flint AGI] that will be covered under the DCO. When complete it will run from the Ince AGI in Cheshire to Talacre Beach in North Wales.	1.4 km	2
2	Hydrodec Oil Re-Refinery Eastham	Planning Inspectorate	The construction of a new hazardous waste recovery facility at Power House Road, Eastham, Port Wirral, Merseyside comprising the construction and operation of a waste oil re-refining plant together with associated and ancillary development.	13.25 km	3
3	60765	Flintshire County Council	Installation and operation of ground mounted solar panels and associated infrastructure	1.95 km	1
4	61171	Flintshire County Council	Construction of new two storey building and erection of 2 no. 27 m high towers	4.7 km	1
5	59026	Flintshire County Council	Erection of 59 no. dwellings and associated works	6.4 km	1
6	59352	Flintshire County Council	Erection of 32 no. dwellings	8.95 km	1
7	59421	Flintshire County Council	Erection of 23 no. apartments and associated works	7.95 km	1

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
8	63291	Flintshire County Council	Change of use of land (114 sqm) at the rear of the property from agricultural to residential, including the erection of decking	7.25km	1
9	62483	Flintshire County Council	Erection of three commercial buildings (B1 Business (Light Industrial), B2 Business Uses and B8 Storage and Distribution Uses) together with the construction of an access road and parking, a pump house, substation, installation of associated infrastructure and platform bases for additional units to form an expansion to Hawarden Business Park.	8.05 km	1
10	58946	Flintshire County Council	Proposed Residential Development	11.45 km	1
11	60336	Flintshire County Council	New build 32 bed extension to an existing care home facility and associated administration/service areas with external landscaping.	7.65 km	1
12	59399	Flintshire County Council	Proposed erection of 52 dwellings including highways, public open space, landscaping and all associated works.	2.5 km	1
13	59055	Flintshire County Council	Proposed erection of 78 dwellings including highways, public open space, landscaping and all associated works	2.5 km	1
14	58296	Flintshire County Council	Erection of 28 no. 2 and 1 Bedroom Apartments (over 55's), and 3 no. Houses (total scheme 100% affordable housing), associated access and parking, including demolition of former public house	4.5 km	1
15	61627	Flintshire County Council	The Construction of a Flexible Gas Fired Power Station.	5.3 km	1
16	58968	Flintshire County Council	Residential development of 20 no. apartments	8.95 km	1
17	60783	Flintshire County Council	Residential development for 20 no. dwellings and associated gardens and car parking.	14.8 km	1
18	62897	Flintshire County Council	Construction of a 26 bedroom extension with lounges and assisted bathrooms to an existing 18 bedroom care home to provide full nursing	12.4 km	1

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
			care facilities. Note one existing bedroom is lost due to the extension, net gain is 25 bedrooms.		
19	FUL/000034/22	Flintshire County Council	Construction of a residential development of 141 no. dwellings and associated works	1.4 km	1
20	FUL/000154/22	Flintshire County Council	Convert 10,000 sq.ft retail unit into 3 no. smaller units comprising: 600, 1400 and 8000 sq.ft units respectively. Change of use of unit G2 from A1 retail to A3 hot food takeaway.	4.7 km	1
21	FUL/000037/23	Flintshire County Council	Redevelopment of the former Cottage Hospital site to provide a new care home comprising of 56 no. bedrooms, complete with new road access and parking, green space and landscaping.	4.8 km	1
22	OUT/001016/23	Flintshire County Council	Erection of a detached block of flats	0.85 km	2
23	FUL/001017/23	Flintshire County Council	Erection of a 66 bedroom care home (Use Class C2) for the elderly with associated access, parking and landscaping.	5.1 km	2
24	SCO/000970/23	Flintshire County Council	EIA Scoping Opinion Request for the construction and operation of carbon capture technology	2.95 km	2
25	OUT/000930	Flintshire County Council	Outline application (to include means of access) for the erection of up to 36 no. residential apartments following the demolition of the Queensferry Hotel.	4.7 km	2
26	FUL/000826/23	Flintshire County Council	Erection of 155 dwellings, construction of a new vehicular access, landscaping and associated works	7.3 km	2
27	FUL/000769/22	Flintshire County Council	Erection of 70 dwellings, construction of a new vehicular access, landscaping and associated works.	14.5 km	2
28	FUL/000414/22	Flintshire County Council	Residential development of 200 dwellings, means of access open space and all associated works.	4.3 km	2

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
29	NAA/000257/22	Flintshire County Council	Proposed Solar Farm.	10.5 km	2
30	DNS/00140/22	Flintshire County Council	Development of National Significance of Solar Farm to include: Solar PV Modules mounted onto frames to form arrays; Transformer units; DNO substation; Fencing & Security measures; Access tracks; Onsite cabling; Outdoor classroom; Car Parking spaces; Offsite connecting the DNO substation on-site to the Saltney Primary substation via grid connection; Landscaping; Temporary construction compound; Associated Site works	11.1 km	2
31	64249	Flintshire County Council	Extension to existing nursing home to provide additional 25 no. bedroom dementia unit, restoration and incorporation of existing listed buildings to form a link to proposed new build.	3.11 km	2
32	63507	Flintshire County Council	Residential development comprising 90 Dwellings including the provision of affordable units, areas of public open space, landscaping and associated works.	6.07 km	2
33	62458	Flintshire County Council	Residential development of up to 140 dwellings, means of access, open space, sustainable drainage infrastructure and all other associated works (outline application including access, with all other matters reserved.)	8.04 km	2
34	61994	Flintshire County Council	Erection of residential development of 232 no. units together with associated public open space and infrastructure	8.26 km	2
35	59739	Flintshire County Council	Erection of 75 to 90 bed extra care facility to include supporting communal facilities and 12 bungalows and all ancillary works	8.27 km	2
36	NMA/23/01624	Wirral Council	Hybrid application for a) Full application for four commercial buildings (Use Classes E, B2 and B8), including ancillary trade counter and showroom) with associated works and b) Outline application (with access) for up to 2 units of a use that could include Cafe/Restaurant/drive through/drive up.	13.68 km	1
37	DPP3/20/00415	Wirral Council	Outline Planning Application (with all matters reserved except access) for development of up to 15 houses and 30 apartments on Woodhead Street	14.92 km	1

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
			car park and land off New Chester Road, together with retention of 70 car park spaces for public use.		
38	DPP3/20/00418	Wirral Council	Outline Planning Application (with all matters reserved except access) for development of up to 23 apartments and 540 sqm retail floorspace on land off Bebington Road, including existing car park off Grove Street, together with retention of 8 car park spaces for public use.	14.85 km	1
39	APP/18/01632	Wirral Council	New Residential Development Comprising of 28 Units	11.71 km	1
40	OUT/19/01633	Wirral Council	Development of up to 500,000 ft^2 (46,450 m^2) of B2 / B8 Use Class floorspace, with ancillary B1(a) Use Class floorspace, service yards, and all associated works including landscaping and car parking with all matters reserved for future consideration.	13.14 km	1
41	APP/19/00315	Wirral Council	Demolition of existing buildings and erection of 127 dwellings with associated landscaping and access	15.00 km	1
42	APP/19/00636	Wirral Council	Proposed demolition and erection of a three storey new build residential development containing 23 Flats (4 no. 1 bed and 19 no. 2 bed). Car Parking located to the rear of the site accessed from both Poll Hill Road and Radnor Avenue. Amenity space is provided to the perimeter and bin & cycle storage is provided adjacent to the car park.	10.65 km	1
43	APP/19/01459	Wirral Council	Erection of an extra care scheme comprising 102 apartments, 1 guest bedroom and ancillary facilities, the conversion of Ravenswood comprising 8 apartments and the erection of 76 dwellings with associated access, car parking and landscaping on land off Highfield South and Ravenswood Avenue	14.81 km	1
44	22/03028/OUT	Cheshire West and Chester Council	Outline planning permission for erection of a hospital building, including the construction of a link to the adjacent building, the erection of compounds for storage and for housing power supply units, the demolition of existing buildings and associated landscape works. Full planning permission for a car park on the 1829 Site and alterations to an on-site roundabout.	13.06 km	1

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
45	21/03611/FUL	Cheshire West and Chester Council	Erection of six commercial buildings for General Industrial and Storage and Distribution uses with ancillary office space, together with the creation of accesses, parking and associated works (Revised Description)	14.93 km	1
46	21/03161/WAS	Cheshire West and Chester Council	Change of use to include Sui Generis waste management uses (handling circa 5,000 tonnes per annum of off-site sources of very low level (VLL) and low level (LL) radioactive wastes) additional to and located within the existing waste processing-related buildings and associated internal and external storage areas currently used for treatment of circa 2,000 tonnes per annum of on-site VLL and LL radioactive wastes associated with the decommissioning of former on-site nuclear enrichment facilities; and additional to the current Uranium enrichment and Tails manufacturing facilities and storage of Uranic materials carried out at the Urenco Complex	9.88 km	1
47	20/03681/FUL	Cheshire West and Chester Council	Battery storage facility and ancillary equipment	9.84 km	1
48	19/03845/OUT	Cheshire West and Chester Council	Erection of 244 bed Hotel (Class C1) over 7 storeys, with associated parking, landscaping and other works with access from Black Diamond Park.	14.49 km	1
49	19/02556/FUL	Cheshire West and Chester Council	Demolition of existing building and construction of a 138 bedroom hotel (Use Class C1) and ancillary accommodation including engineering and associated works.	14.65 km	1
50	23/02149/S73	Cheshire West and Chester Council	Erection of six commercial buildings for General Industrial and Storage and Distribution uses with ancillary office space, together with the creation of accesses, parking and associated works - Variation of conditions 2 (approved plans), 9 (external lighting), 14 (Habitat Management and Maintenance Plan) and 17 (landscaping details) of planning permission 21/03611/FUL	14.84 km	2

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
51	23/03377/FUL	Cheshire West and Chester Council	Erection of 152 dwellings and provision of infrastructure including internal road layout, landscaping, children's play area and associated works (Re-submission of 22/03064/FUL)	13.81 km	2
52	22/04675/OUT	Cheshire West and Chester Council	Demolition of Oaktree Court Business Centre and Livery and the erection of up to 21 residential dwellings with associated infrastructure	7.50 km	2
53	22/04461/S73	Cheshire West and Chester Council	Erection of mixed use development comprising of 23 dwellings and 23 commercial units (B1) following demolition of the existing buildings on the site - variation of condition 2 (approved drawings) of 19/02685/S73 to reflect elevational changes, installation of Air Source Heat Pumps and solar panels	14.75 km	2
54	22/03736/FUL	Cheshire West and Chester Council	Demolition of existing farmhouse and associated outbuildings and erection of 54 dwellings and the provision of associated infrastructure (including roads, footpaths, cycleways, landscaping and children's play area) and two new ponds located off Lache Lane	14.81 km	2
55	22/02572/REM	Cheshire West and Chester Council	Erection of a seven-storey apartment building comprising 133 no. units including associated access, parking and landscaping works.	14.91 km	1
56	22/01679/S73	Cheshire West and Chester Council	Part A - (full permission) for phased development of 483 dwellings and associated infrastructure (including playing fields / open space); Part B - (outline permission - all matters reserved apart from access) for a local centre (comprising supermarket (Use Class A1 (500 sqm); other shops (Use Class A1)(500 sqm); cafe/restaurant (Use Class A3)(200 sqm); public house (Use Class A4)(650 sqm); and nursery/creche (Use Class D1) (600 sqm) plus an outdoor play area) and a primary school with associated playing fields (Hybrid application) - Variation to condition 4 (approved plans) under 17/02453/OUT to coincide with amendments to the layout including plot / house type substitutions and landscape details.	14.57 km	2
57	21/01358/FUL	Cheshire West and Chester Council	Extension, alteration and conversion of former office buildings and associated outbuildings to create an aparthotel comprising of 54 no. apartments (use class C3) (with incidental outdoor pool / terrace), 6 no.	14.02 km	2

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
			mews cottages (Use Class C3) and a restaurant (Class E). And the erection of 3 no. apartments (Use Class C3) on former car park off Nicholas Street Mews		
58	21/01243/FUL	Cheshire West and Chester Council	Erection of 63 dwellings comprising 26 one and two bedroom apartments in a 2 storey block; 12 one bedroom 'walk-up' cottage style apartments, 22 two bedroom houses and 3 four bedroom houses. New access road and associated external works.	13.60 km	1
59	20/04060/FUL	Cheshire West and Chester Council	Erection of 29 dwellings including all associated infrastructure, parking and private/communal amenity space	14.71 km	1
60	20/00789/FUL	Cheshire West and Chester Council	Demolition of the former Station Hotel and erection of 25 affordable apartments	14.16 km	1
61	19/03292/FUL	Cheshire West and Chester Council	Construction of 52 no. new dwellings (Use Class C3) with associated access, parking and landscaping.	12.02 km	1
62	19/03291/FUL	Cheshire West and Chester Council	Construction of 55 no. dwellings (Use Class C3) with associated access, landscaping and parking	13.18 km	1
63	20/04850/OUT	Cheshire West and Chester Council	Hybrid Planning Application for a gas engine electricity generating plant with a maximum generating capacity of 22.5 MWe and Units for B2/B8 General Industrial / Storage and Distribution uses	13.65 km	1
64	19/04561/OUT	Cheshire West and Chester Council	Development of up to 500,000 ft^2 (46,450 m^2) of B2/B8 use class floorspace, with ancillary offices, service yards, and all associated works including landscaping and car parking with all matters reserved for future consideration.	13.54 km	1
65	STR3A Strategic Site	Flintshire County Council	Local Plan 2015: 1325 houses, 72.4 ha of B2/B8 employment land	N/A	3
66	STR3B Strategic Site Warren Hall Development Site	Flintshire County Council	Local Plan 2015: 19.1 ha of B1 and B2	N/A	3

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
67	Policy WM 3: Allocations for District level Sites	Wirral Council	Waste Local Plan 2013: 2 sites in Wirral: -W2 Bidston MRF / HWRC, Wallasey Bridge Road 3.7 ha, uses (HWRC, WTS, Re-processor, Primary Treatment) -W3 Former Goods Yard, Adjacent Bidston MRF/HWRC, Wallasey Bridge Road 2.8ha uses (WTS, Reprocessor, Primary Treatment)	N/A	3
68	22/00090/S73	Cheshire West and Chester Council	Development of up to 500,000 ft^2 (46,450 m^2) of B2/B8 use class floorspace, with ancillary offices, service yards, and all associated works including landscaping and car parking with all matters reserved for future consideration (Variation of condition 3 (Parameter plans) and removal of condition 9 (Safeguarding disused rail corridor) to planning permission under 19/04561/OUT	13.56 km	2
69	23/01294/NMA	Cheshire West and Chester Council	Residential development, including provision of temporary sales area, and provision of formal and informal open space and associated works including highways and drainage works, pedestrian/cycle level rail crossing to Percival Road, enhancement works within Jacks Wood, together with improvements to footbridge approach on Ross Road following demolition of existing building - Non-material amendment to application 20/03599/FUL to amend Condition 2 (approved plans - update to plot 106 and 186), Condition 14 (omitting cladding from plot 175) and Condition 18 (Unit 1 Demolition)	13.02 km	1
70	21/03392/HAZ	Cheshire West and Chester Council	Introduction of new substances (Oxygen and Natural gas) and increase to the quantities of Hydrogen, plus substances within the flammable gases and environmental hazard categories	16.72 km	1
71	APP/19/01882	Wirral Council	The installation of 10 gas powered generators with ancillary buildings and equipment to form a ‘flexible generation’ power plant, (Use Class Sui Generis) with the formation of vehicular access from Riverbank Road and the erection of 4.5 metre high gabion walling and 4.5 metre high acoustic fencing to site boundaries.	14.19 km	1

UpID	Application Reference	Local Planning Authority	Brief Description	Distance from Proposed Development	Tier
72	APP/19/01792	Wirral Council	Development by MBE Construction and Torus Group to provide 30 new 1 and 2 bed apartments including complimentary external works and landscaping	16.61 km	1
73	APP/20/01728	Wirral Council	43 affordable rent residential units (Use Class C3) comprising of 2 bungalows, 8 apartments, and 33 two storey houses.	16.04 km	1
74	APP/20/01084	Wirral Council	Change of use from school to residential for the proposal of the refurbishment of Redcourt, a grade II listed vacant school building, into 15 no. 1 and 2 bedroom apartments. Adjacent to Redcourt, it is proposed to build a 3/4 storey stand alone apartment block, comprising 30 no. 1 and 2 bedroom apartments. Both apartment blocks will have separate vehicular and pedestrian access from Devonshire Place, car parking, cycle storage, bin storage and generous private amenity space is provided.	16.74 km	1

Appendix E Transboundary Effects Matrix

Appendix E Transboundary Effects Matrix

Regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the consideration of any likely significant effects on the environment of European Economic Association (EEA) States.

Guidance upon the consideration of transboundary effects is provided in the PINS's Advice Note 12: Transboundary Impacts and Process.

Paragraph 3.1.4 of PINS Advice Note 12 explains:

3.1.4 All NSIPs that are EIA development will be subject to a transboundary screening process determined and undertaken by the Inspectorate on behalf of the SoS. Where the SoS is satisfied that the likelihood of transboundary effects is extremely low, the transboundary screening decision will be included in a scoping opinion (if one is requested) or as a separate, short proforma where a scoping opinion is not requested. If the SoS is not satisfied that the likelihood of transboundary effects is extremely low, the transboundary screening decision will be provided in a separate long proforma. The position in respect of the likelihood of transboundary effects will remain under review pending any new or materially different information coming to light. However, the Inspectorate will not update the screening decision where it remains valid.

The following screening matrix provides the consideration of transboundary effects for the Proposed Development, taking guidance from Advice Note 12 (Annex 1).

Criteria and Relevant Consideration	Commentary with Regard to the Proposed Development
Characteristics of the development: • Size of development; • Use of natural resources; • Production of waste; • Pollution and nuisance; • Risk of accidents; and • Use of technologies.	The proposed CCGT generating station will be designed to operate with post-combustion CCP plant installed such that the plant can be operated as a dispatchable, low-carbon generating station. The Site encompasses a total area of approximately 112 ha and is indicative at this stage encompassing the natural gas, CO_2, electricity and water connections that may be required. The resources required for the construction of the Proposed Development are likely to be obtained from the global to local scale markets and where reasonably practicable, materials would be obtained locally. No waste, nuisances or accidents are likely to extend beyond the border of the UK. No novel technologies are proposed that have potential for transboundary effects.
Location of development and Geographical area • What is the existing use?; • What is the distance to another EEA state? (Name EEA state)?; and • What is the extent of the area of a likely impact under the jurisdiction of another EEA state?	The Proposed Development's closest EEA boundary is the Republic of Ireland, located approximately 195 km to the west. No impacts are likely to extend beyond the jurisdiction of the UK.

Criteria and Relevant Consideration	Commentary with Regard to the Proposed Development
Environmental importance: • Are particular environmental values likely to be affected?; • Capacity of the natural environment; and • Wetlands, coastal zones, mountain and forest sites, nature reserves and parks, Natura 2000 sites, area where environmental quality standards already exceeded, densely populated areas, landscapes of historical, cultural or archaeological significance.	Potential impacts and the potential for likely significant effects on relevant qualifying features of internationally designated sites (referred to as Habitat Sites) will be considered and presented within a HRA Report that will accompany the DCO Application. The Site is partially located within and in close proximity to a Ramsar site, SPA, and SAC. This natural environment is juxtaposed with an existing industrialised area of Flintshire, including the existing CCGT Connah's Quay Power Station. The Proposed Development forms part of a long-term replacement strategy for the existing CCGT on the Main Site. It is not anticipated that there is potential for transboundary effects (and therefore any effects on important environmental receptors beyond the UK).
Potential impact and carrier • By what means could impacts be spread?	The primary available pathways for impact include emissions to atmosphere and emissions to water.
Extent • What is the likely extent of the impact? Magnitude • What will the likely magnitude of the change in relevant variables relative to the status quo, taking into account the sensitivity of the variable? Probability • What is the degree of probability of the impact? • Is the impact likely to occur as a consequence of the normal conditions or exceptional situations, such as accidents? Duration • Is the impact likely to be temporary, short-term or long-term? • Is the impact likely to relate to the construction, operation or decommissioning phase of the activity? Frequency • What is likely to be the temporal pattern of the impact Reversibility • Is the impact likely to be reversable or irreversible	The only potential transboundary environmental impact is considered to arise from GHG emissions, which would be spread by atmospheric processes. It is recognised that GHG emissions contribute to changes to climate that occur on a global scale. The impact of GHG emissions is considered irreversible within human lifetimes, however, the Proposed Development seeks to align with and contribute positively to the UK Government's target to achieve net-zero emissions by 2050. It is proposed to calculate the likely GHG emissions generated by the Proposed Development as part of the EIA and report these within the ES that accompanies the DCO Application. In line with relevant guidance, the Proposed Developments emissions will be contextualised against the UK national and Welsh carbon budgets as proposed by the CCC, agreed by government, and ratified by parliament and Senedd Cymru, respectively. In any event, the global nature of GHG impacts means that it is not possible to apportion or identify any impact in GHG emissions in terms of environmental effects on any particular country or state. Due to the distance to the nearest EEA State, it is considered unlikely that any impacts that arise from the Proposed Development would generate any significant effect to any receptor in any other EEA State including those impacts resulting from GHG emissions from the Proposed Development, as the environmental receptor in this regard is the global atmosphere, rather than the environment of any country or state or group

Criteria and Relevant Consideration	Commentary with Regard to the Proposed Development
	of countries or states. The GHG emissions are considered at a global level, and so are captured by the assessment in any event. The magnitude of the climate change impacts will be assessed and reported in the ES as part of the GHG assessment in the Climate Change chapter. GHG emissions are probable and will occur as a result of normal operation of the Proposed Development, noting that the Proposed Development will be designed to capture the CO_2. CO_2 emissions will result from both the construction and operational phases. The impact to the global atmospere long-term, however, the Proposed Development is intended to contribute to the UK's long-term GHG emissions reduction targets.
Cumulative impacts • Are there other major development close by?	Schemes within 15 km of the Proposed Development will be taken into consideration in the EIA. On this basis, it is not anticipated that there is potential for likely significant cumulative transboundary effects.