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Connah's Quay Low Carbon Power

Environmental Statement Volume I Non-Technical Summary (Tracked)

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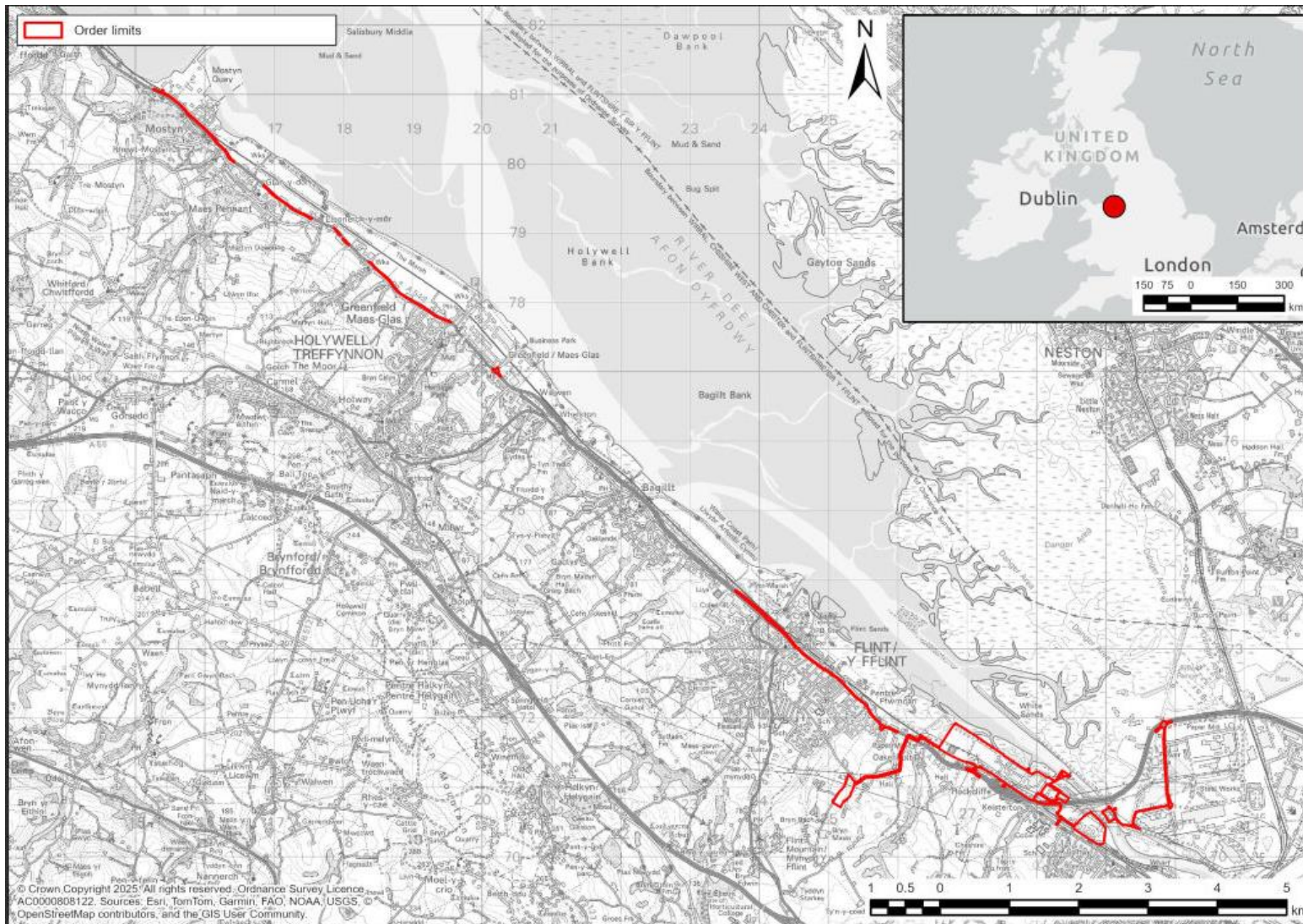
1. Introduction

1.1 Overview

- 1.1.1 This Non-Technical Summary (NTS) of the Environmental Statement (ES) has been prepared for the Connah's Quay Combined Cycle Gas Turbine (CCGT) fitted with Carbon Capture Plant (CCP) (hereafter referred to as the Proposed Development) and provides a summary of the findings of the Environmental Impact Assessment (EIA) process.
- 1.1.2 The ES has been prepared to accompany the DCO application and presents the findings of the EIA. It includes a description of the Proposed Development, and the reasonable alternatives considered in the evolution of the design, information about the existing local environment and the likely significant effects of the Proposed Development on the environment and local communities, and the measures proposed to mitigate these effects.
- 1.1.3 The Proposed Development is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008, which means that permission is required from the Secretary of State to build and operate it. The permission is called a Development Consent Order (DCO). The Proposed Development falls within the definition of an NSIP under Section 14(1)(a), 15(1) and 15(3A) of the Planning Act 2008 (Ref. 6) as a generating station in Wales with a capacity of more than 350 MW. The DCO application will be examined by the Planning Inspectorate (PINS), which will make a recommendation to the Secretary of State, who will then determine the application.
- 1.1.4 The DCO for the Proposed Development is being sought for by Uniper UK Limited (hereafter referred to as the Applicant). The Applicant is seeking a DCO for the demolition of an existing gas treatment plant (GTP) and above-ground installation (AGI), store buildings, and contractors' facilities associated within the existing Connah's Quay Power Station; and construction, operation (including maintenance), and decommissioning of a proposed low CCGT Generating Station fitted with CCP (the Connah's Quay Low Carbon Power (CQLCP) Abated Generating Station) and supporting infrastructure 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 (the Proposed Development Site).
- 1.1.5 The Proposed Development Site (hereafter referred to as the Order limits) is shown in **Plate NTS 1** below. The Order Limits illustrate the geographical extent of the temporary and permanent land take required for the construction and operation of the Proposed Development.
- 1.1.6 This Non-Technical Summary is structured as follows:
- Section 1 – this section – provides an overview of the Proposed Development and the Applicant;
 - Section 2 describes the Proposed Development;
 - Section 3 describes the construction of the Proposed Development;
 - Section 4 sets out the consideration of alternatives;

- Section 5 describes the consultation undertaken;
- Section 6 describes the existing environment;
- Section 7 sets out the methodology for the EIA;
- Section 8 describes the results of the EIA, with sub-sections per environmental topic,
- Section 9 provides a summary of the residual effects; and
- Section 10 describes what happens next, after the submission of the DCO application.

Plate NTS 1: Order limits



1.2 The Applicant

- 1.2.1 The Applicant is a UK-based company, wholly owned by Uniper SE (Uniper) through Uniper Holding GmbH. Uniper is a European energy company with global reach and activities in more than 40 countries. With around 7,500 employees, the company makes an important contribution to security of supply in Europe, particularly in its core markets of Germany, the UK, Sweden, and the Netherlands. In the UK, Uniper owns and operates a flexible generation portfolio of power stations, a fast-cycle gas storage facility and two high pressure gas pipelines, from Theddlethorpe to Killingholme and from Blyborough to Cottam.

Uniper is committed to investing around €8 billion (~£6.9 billion) in growth and transformation projects by the early 2030s and aims to be carbon-neutral by 2040. To achieve this, the company is transforming its power plants and facilities and investing in flexible, dispatchable power generation units. Uniper is one of Europe's largest operators of hydropower plants and is helping further expand solar and wind power, which are essential for a more sustainable and secure future. Uniper is gradually adding renewable and low-carbon gases such as biomethane to its gas portfolio and is developing a hydrogen portfolio with the aim of a long-term transition. The company plans to offset any remaining CO₂ emissions by high-quality CO₂-offsets.

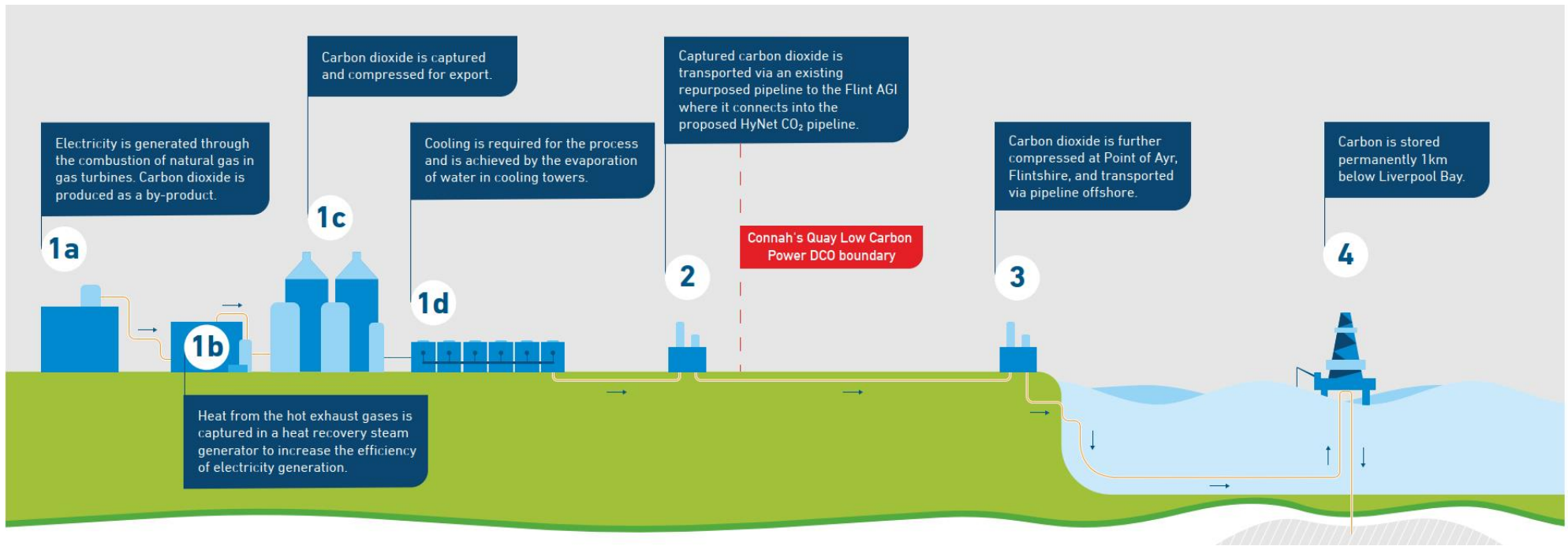
1.3 What is Carbon Capture and Storage?

- 1.3.1 Carbon capture and storage (CCS) is a key part of the process to reduce carbon emissions in energy generation. It involves the removal and capture of carbon dioxide (CO₂) from power plant emissions, transporting it away to be securely stored underground, often in aquifers or depleted oil and gas fields. This is illustrated in **Plate NTS 2**.
- 1.3.2 CCUS also refers to carbon capture and storage but with the 'U' referring to utilisation of the captured CO₂. Captured CO₂ can be used for a variety of industrial purposes, such as the production of synthetic fuel and low carbon building materials, or in the food and beverage industry.

1.4 The Need for the Project

- 1.4.1 It is important to ensure the UK's power system is secure and reliable, particularly as the UK becomes more reliant on electricity. According to the UK's independent advisor on climate change, the Climate Change Committee (CCC), demand for electricity is forecast to increase by 50% by 2035, and so more electricity generation capacity will be needed.
- 1.4.2 The proposed new CCGT power station with carbon capture at Connah's Quay would be able to flexibly and reliably generate low carbon power to meet the growing need for electricity, whenever it is required. Power stations such as this will play a crucial role in the future energy system, as they can help ensure that energy is available at times when it is needed most, and when power from renewable sources cannot meet demand.

Plate NTS 2: Carbon Capture and Storage Process



2. The Proposed Development

2.1 Areas in the Order Limits

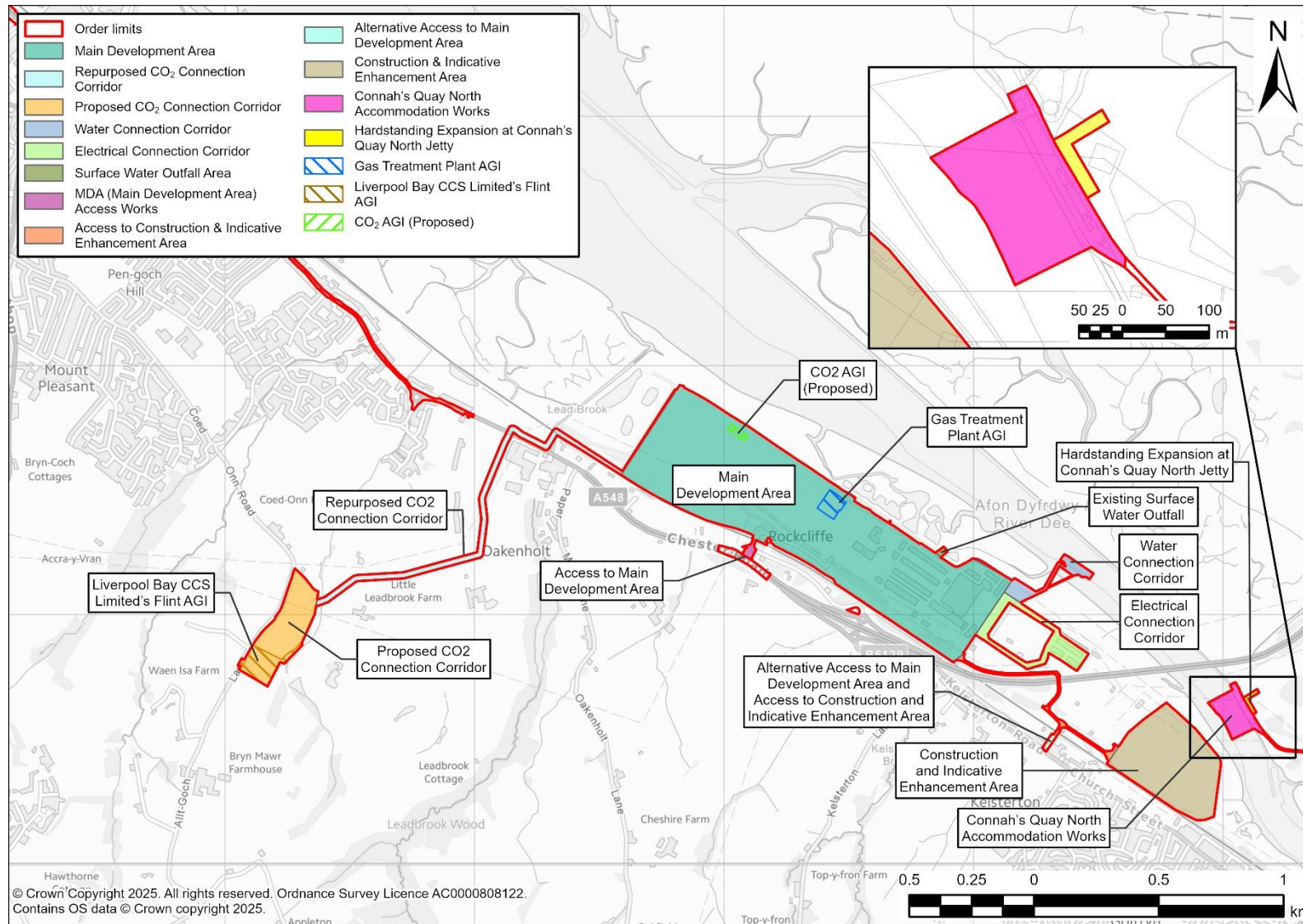
2.1.1 The areas referred to in the ES are shown in **Plate NTS 3**. For the purposes of the ES, the naming conventions used to describe areas of the Order limits within the Construction and Operation Area (this includes all areas within the Order limits apart from the Accommodation Works Areas) are the:

- **Main Development Area** is an area of around 56.45 ha that includes operational parts of the existing Connah's Quay Power Station and agricultural fields. Areas of the Main Development Area would be developed for the proposed CCGT and CCP and used for temporary laydown areas during construction. It is bordered generally to the north by the Dee Estuary, to the east by the existing National Grid Electricity Transmission plc (NGET) 400 kV Substation, and to the south by the North Wales Main Line railway;
- **Repurposed CO₂ Connection Corridor** is an area between the south-west corner of the Main Development Area and the north-east corner of the Proposed CO₂ Connection Corridor. It comprises around 4.34 ha and is largely agricultural fields and hedgerows. It follows 3 km of the route of an existing underground gas pipeline between the existing Connah's Quay Power Station and Point of Ayr Gas Terminal to the north-west;
- **Proposed CO₂ Connection Corridor** mirrors the area consented for the proposed Flint Above Ground Installation (Liverpool Bay CCS Ltd's Flint AGI) and Newbuild CO₂ Pipeline works within the HyNet CO₂ Pipeline Project (refer to Section 2.4). It comprises 6.21 ha within which a new CO₂ export pipeline approximately 422m in length for the Proposed Development would be constructed linking the Repurposed CO₂ Connection Corridor at one end, with the area consented for the proposed Liverpool Bay CCS Limited's Flint AGI at the other end;
- **Water Connection Corridor** is an area of around 1.60 ha which includes the existing abstraction and discharge infrastructure for cooling water sourced from the River Dee for the existing Connah's Quay Power Station. It includes both intertidal mudflat and saltmarsh habitats of the Dee Estuary and the River Dee itself. Subject to minor modification and alteration, the Proposed Development would utilise the existing Connah's Quay Power Station cooling water abstraction and discharge infrastructure located within the River Dee;
- **Electrical Connection Corridor** is an area of 3.40 ha which includes the existing electrical export transmission cable(s) that interface with the Main Development Area and the existing NGET 400 kilovolt (kV) Substation;
- **Construction and Indicative Enhancement Area (C&IEA)** is an approximate 12.58 ha area of vacant land under the Applicant's ownership south-east of the Main Development Area which currently comprises derelict hardstanding with scrub / grass vegetation, open grassland and small trees. Following use during construction as a

laydown area, the C&IEA would be used for ecological mitigation. The **Outline Landscape and Ecological Management Plan (LEMP) (EN010166/APP/6.9)** sets out plans to identify these areas and the implementation plan for these measures;

- **Main Development Area Access Works Area** comprises Kelsterton Road, including a bridge over the North Wales Main Line railway, and part of a former junction between the A548 and Kelsterton Road. This area comprises around 0.24 ha of existing hardstanding with small areas of roadside, kerbs, trees and grass;
- **Alternative Access to Main Development Area** and **Access to C&IEA** is an existing hardstanding road that runs from the B5112 towards the Electrical Connection Corridor beneath the A548 Flintshire Bridge; and
- **Surface Water Outfall Area** is the area including and surrounding the existing artificial outfall for surface water drainage from the existing Connah's Quay Power Station into the Dee Estuary. A new surface water outfall would be required; and
- **Hardstanding Expansion at Connah's Quay North Jetty** comprises an area of hardstanding and low lying vegetation adjacent to the existing area of hardstanding at the Connah's Quay North Jetty. It is located on the northern side of the estuary directly to the north of the C&IEA. This area would be used to create an expansion to the existing areas of hardstanding within the Connah's Quay North Jetty.

Plate NTS 3: Areas referred to in the ES (centered on Main Development Area)



2.1.2 The Order limits also include the 'Accommodation Work Areas' which are included to facilitate the transport of abnormal indivisible loads from sea to the Main Development Area during construction of the Proposed Development. These are shown in **Plate NTS 4** and are:

- *A548 from Port of Mostyn to Greenfield*: comprising of the route of the existing highway along the A548 between the entrance to the Port of Mostyn and the village of Greenfield and the immediate entrance of the existing Port of Mostyn;
- *Tir Glas Roundabout*: limited to Tir Glas roundabout on the A548 between Greenfield and Whelston;
- *A548 through Flint to Chester Road Roundabout*: comprising the route of the existing highway along the A548 through Flint and includes the Chester Road roundabout;
- *Abnormal Indivisible Load (AIL) Access*: comprises a section of the A548 Chester Road adjacent to the Main Development Area Access Works Area;
- *Connah's Quay North*: comprising of the existing jetty at Connah's Quay North, including marine and terrestrial components, and the access road from North Road/River Road; and
- *North Road to the A548*: comprising of the North Road from the entrance to Connah's Quay North to the A548 Weighbridge Road roundabout.

2.2 Proposed Development Phases

2.2.1 The detailed design of the Proposed Development will be developed in line with the parameters set in the DCO application.

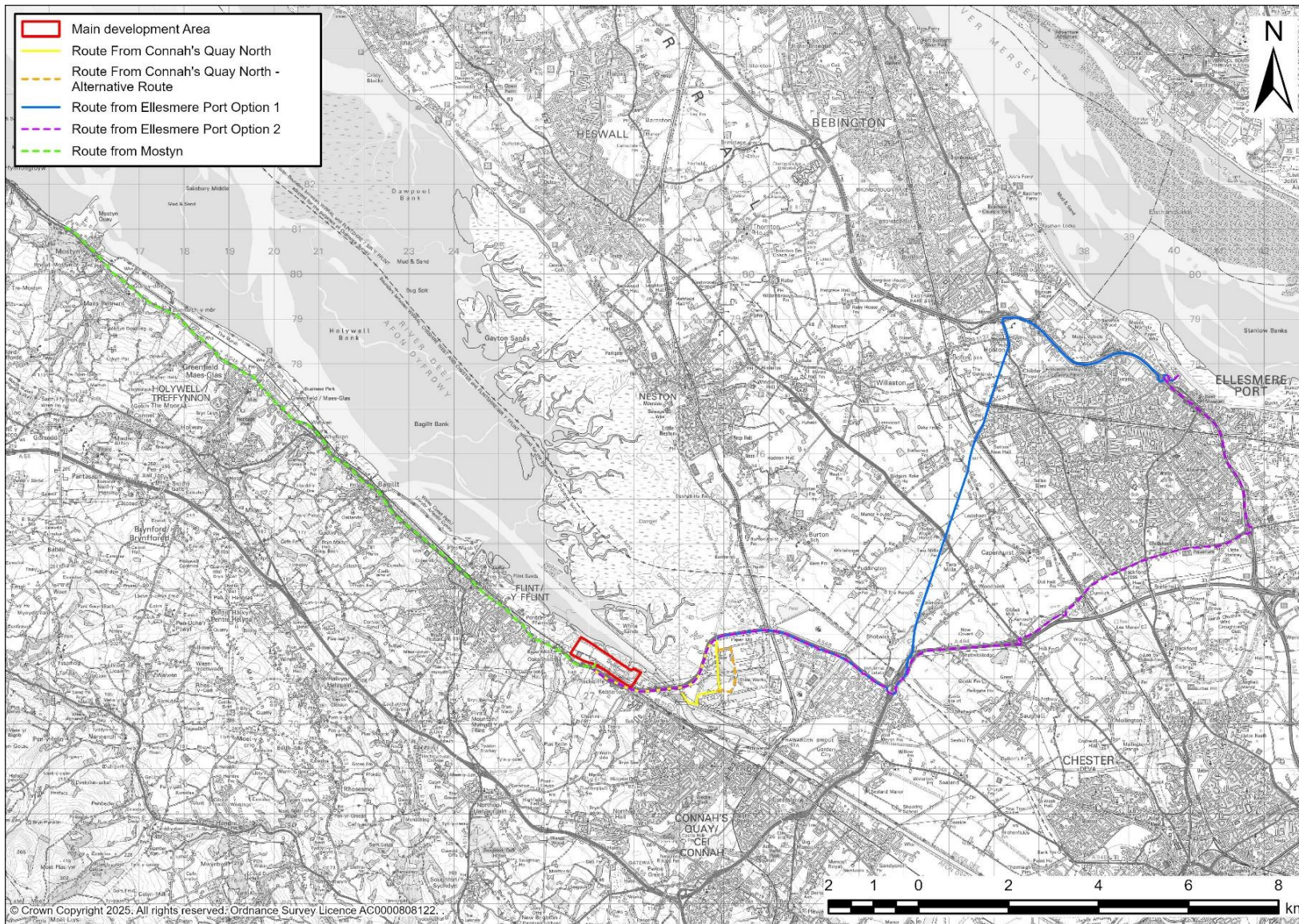
2.2.2 The three key phases of the Proposed Development include:

- **Construction** – between five and nine years, subject to a simultaneous or a phased construction approach, comprises high level stages:
 - *Site enabling works* – including erection of site fencing, environmental surveys, demolition of several existing structure on site, site clearance, establishing contractor's facilities, ecological mitigation measures and diversion and laying of services;
 - *Works to Proposed CO₂ Connection Corridor* - including a new CO₂ pipeline;
 - *Earthworks* – including reprofiling of the Main Development Area to produce a level platform;
 - *Main civil works* – including civil works to construct the CQLCP Abated Generating Station and associated connections and integration with the existing powers station;
 - *Work within the Water Connection Corridor* - utilising the existing cooling water abstraction and discharge infrastructure with minor additions and refurbishments; and
 - *Commissioning* – including composition monitoring and commissioning of the process equipment in order to check that all

systems and components installed are in accordance with the requirements of the undertaker;

- **Operation (including maintenance)** – The Proposed Development would operate flexibly during its lifetime with hours of operation driven by the dynamics of the energy market. The CQLCP Abated Generating Station has been designed to be capable of operating 24 hours per day, seven days per week. Planned maintenance outages are likely to occur approximately once every four years per Train. These outages would not occur at both Trains at the same time; and
- **Decommissioning** – each Train of the Proposed Development is expected to operate for up to 30 years, with the majority of equipment designed for long-term use. Any future decision to extend its lifespan, would be subject to the Applicant undertaking a financial investment decision based on a number of factors, such as safety and the regulatory requirements at that time. It is anticipated that the Proposed Development would be shut down, with all above-ground structures on the Main Development Area removed, and the ground remediated as required to facilitate future re-use. It is also assumed that cooling water infrastructure in the Dee Estuary and all buried assets would be left in-situ and the associated pipework treated or filled.

Plate NTS 4: Accommodation Work Areas (to facilitate the transport of abnormal indivisible loads)

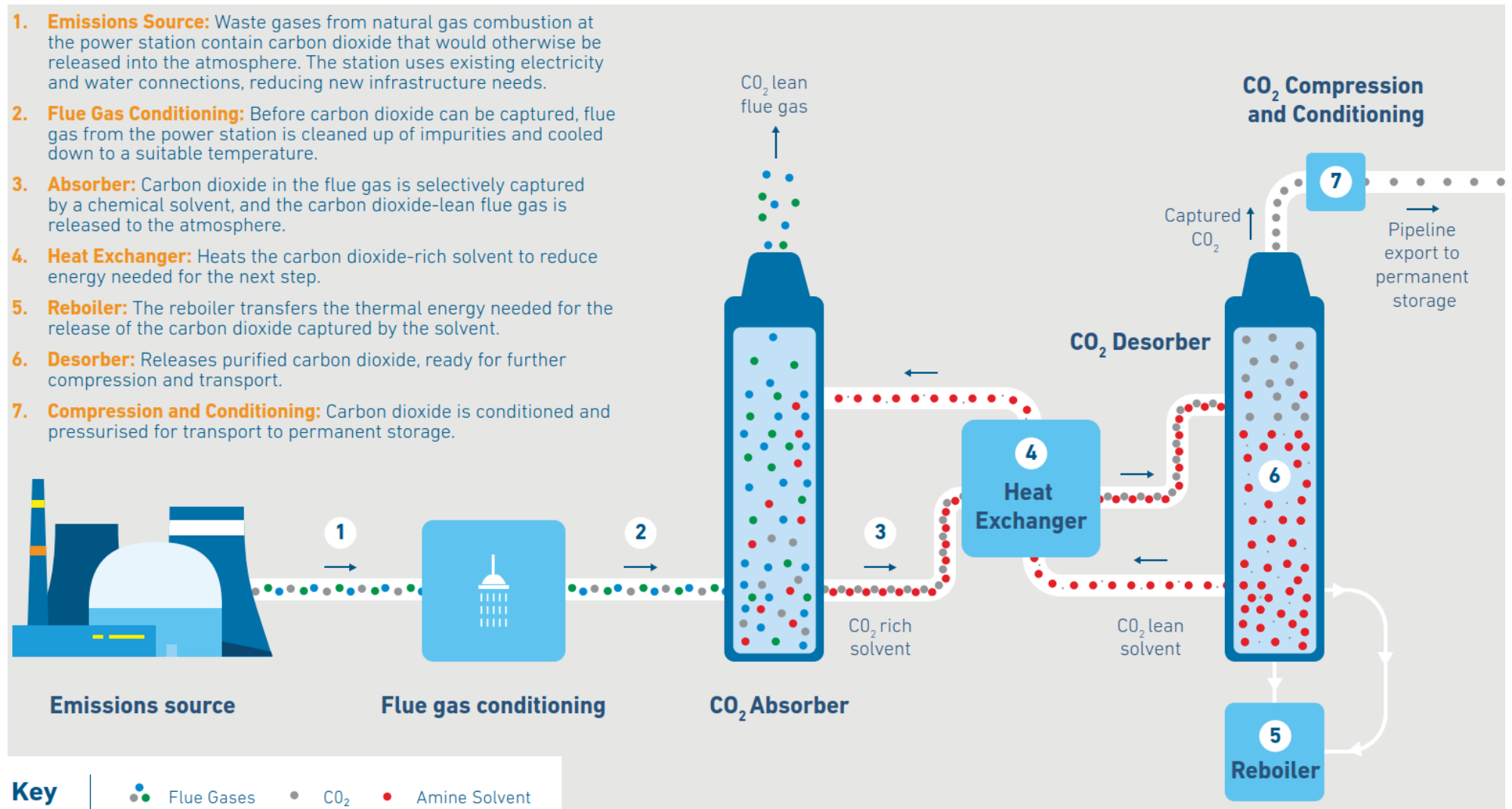


2.3 Overview of Gas-Fired Power Electricity and Carbon Capture Plant

- 2.3.1 This section provides a non-technical description of the process of electricity generation and carbon capture associated with the Proposed Development.
- 2.3.2 In the CCGT(s) of the CQLCP Abated Generating Station, natural gas that has been conditioned to the required temperature and pressure would be burned in the CCGT. Following combustion, the hot product gases enter the gas turbine where, by expanding, they would cause it to rotate and drive an electrical generator.
- 2.3.3 The gas turbine exhaust gases are passed through the Heat Recovery Steam Generator (HRSG) to recover the useful heat in order to produce steam (at various pressures) to generate further power via a separate steam turbine, and for heating of process streams within the CCP.
- 2.3.4 Natural gas would be supplied to the proposed CCGT unit(s) from the National Transmission System (NatTS) from Burton Point AGI, via an existing Applicant owned and operated pipeline and the existing Applicant owned and operated Connah's Quay AGI; at the Connah's Quay AGI, the natural gas would be conditioned to the required temperature and pressure for combustion in the CCGT.
- 2.3.5 During normal operation, i.e. when the CCP is being operated, the flue gases (i.e. waste gases from the combustion process) are expected to be treated with Selective Catalytic Reduction (SCR) to achieve the required NO_x concentration reduction before entering the CCP. If the CCGT had to operate unabated (for example, during outages of the CCP), exhaust gases would not be treated with SCR and would instead be vented through a dedicated stack above the HRSG building. Venting untreated gases will not happen during normal operation.
- 2.3.6 This process for normal operation is illustrated in **Plate NTS 5**.

Plate NTS 5: Carbon Capture Process

1. **Emissions Source:** Waste gases from natural gas combustion at the power station contain carbon dioxide that would otherwise be released into the atmosphere. The station uses existing electricity and water connections, reducing new infrastructure needs.
2. **Flue Gas Conditioning:** Before carbon dioxide can be captured, flue gas from the power station is cleaned up of impurities and cooled down to a suitable temperature.
3. **Absorber:** Carbon dioxide in the flue gas is selectively captured by a chemical solvent, and the carbon dioxide-lean flue gas is released to the atmosphere.
4. **Heat Exchanger:** Heats the carbon dioxide-rich solvent to reduce energy needed for the next step.
5. **Reboiler:** The reboiler transfers the thermal energy needed for the release of the carbon dioxide captured by the solvent.
6. **Desorber:** Releases purified carbon dioxide, ready for further compression and transport.
7. **Compression and Conditioning:** Carbon dioxide is conditioned and pressurised for transport to permanent storage.



2.4 Components of the Proposed Development

2.4.1 The Proposed Development comprises of:

- the demolition of an existing gas treatment plant (GTP); AGI, store buildings, and contractors' facilities within the existing Connah's Quay Power Station Site; and
- the construction, operation, and maintenance of a CCGT generating plant with Carbon Capture Plant. This would be known as the CQLCP Abated Generating Station.

2.4.2 The main components of the Proposed Development are:

- CQLCP Abated Generating Station which comprises of:
 - CCGT Generating Plant and Associated Stacks;
 - Post-Combustion CCP and Associated Stacks; and
 - Other Ancillary Buildings and Structures;
- CO₂ Export and Third-Party Connections; and
- Other Connections and Ancillary Infrastructure.

2.4.3 Each of the main components of the Proposed Development are explained in more detail in the following subsections.

Connah's Quay Low Carbon Power Abated Generating Station

Combined Cycle Gas Turbine Generating Plant and Associated Stacks

2.4.4 The CQLCP Abated Generating Station would be made up of two combined cycle gas turbines with Carbon Capture Plants (and supporting infrastructure). These are referred to in the ES as "Trains". It is anticipated that the two Trains would be constructed in a phased manner or simultaneously and may share certain facilities. Once built, they will be independent from one another during operation.

2.4.5 The buildings which house the CCGT would be up to 6,700 m² per Train, with a maximum height of 50 m (above ground level). These are shown as Area 1A in **Plate NTS 6**.

2.4.6 The HRSG buildings (Area 1B in **Plate NTS 6**), would be up to 3,450 m² per Train m and 50 m (above ground level). The HRSG would include a stack, which would serve as a bypass stack, running independently from the CCP. This stack would discharge exhaust gases during certain circumstances, such as during an outage of the CCP. The stack would be up to 12.3 m in diameter and up to 130 m (above ground level) in height.

2.4.7 The Trains would achieve a net electrical output capacity of more than 350 megawatts (MW; referred to as MWe for electrical output) and up to a likely maximum of 1,380 MWe (with CCP operational) onto the national electricity transmission network.

2.4.8 The Proposed Development would be fuelled by natural gas and requires electricity, cooling water, mains water, data/telecommunications, and CO₂

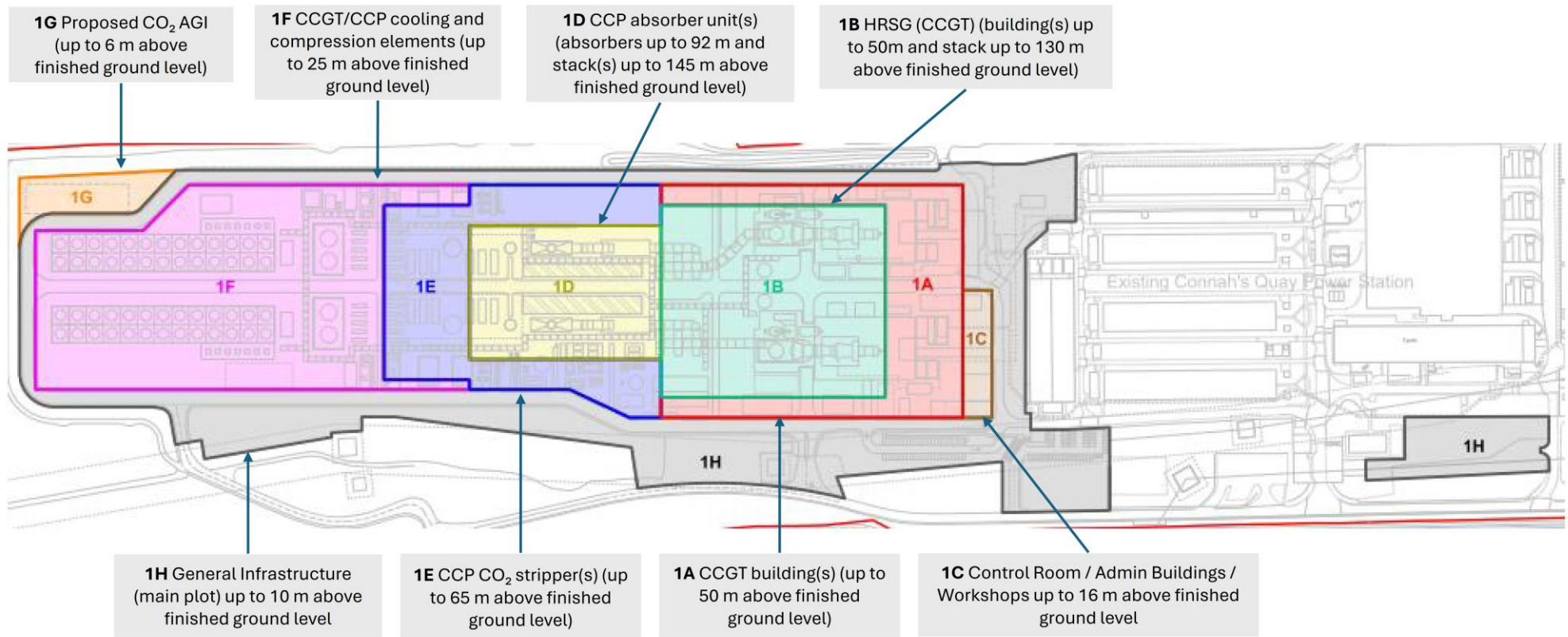
transport and storage (T&S) connections. It will be designed to operate with a post-combustion CCP installed and would generally be operated in response to demand (also known as 'dispatchable').

- 2.4.9 There are existing available infrastructure links including electrical grid and gas, specifically the National Grid Electricity Transmission and National Gas Transmission networks which the Proposed Development could utilise.

System Restoration Capability

- 2.4.10 The Proposed Development could also be designed to include a 'system restoration' capability, which would enable the CQLCP Abated Generating Station to start-up without any assistance from the National Grid Electricity Transmission System (NGETS), in the event of a total or partial shutdown of Great Britain's electricity transmission system. The Proposed Development could then be used to help restore power to the national grid, if called upon by the National Energy System Operator (NESO). Power stations without this system restoration capability need to draw power from the NGETS to start operation.

Plate NTS 6: Indicative Illustration of Maximum Parameters for the Main Project Development Components



Post-Combustion Carbon Capture Plant and Associated Stacks

- 2.4.11 In a conventional CCGT plant, the gas turbine exhaust gases are released from the HRSG via a vertical stack into the atmosphere. However, in the Proposed Development, the exhaust gas would be directed into the CCP for the removal of CO₂ from the gas stream.
- 2.4.12 The CCP would be capable of capturing a minimum of 95% of the CO₂ emitted (by weight) from the power station. The benefits of the Proposed Development would therefore be to supply low-carbon electricity to the UK electricity supply grid which could displace higher carbon intensity grid electricity (or other power generation sources).
- 2.4.13 The CCP would include a CO₂ absorber column(s) and associated stack(s), a CO₂ removal column (stripper/ regenerator) and associated supporting equipment including storage of the chemical solvent that would remove the CO₂ from the gas stream. The solvent to be used is the subject of ongoing technical studies but is assumed to be a solution of amines which selectively absorb gases such as CO₂.
- 2.4.14 The elements of the CCP are shown in **Plate NTS 6** as Area 1D and their dimensions are 375 m² per absorber; 7.5 m in diameter for the stack, and up to 145 m, above ground level, in height. These are shown in **Plate NTS 6** as Area 1D. The CO₂ strippers would be up to 180 m² and 65 m above ground level in height and are shown in **Plate NTS 6** as Area 1E.
- 2.4.15 The captured CO₂ would be treated in a gas conditioning and compression facility to remove traces of oxygen before it is sent to the Repurposed CO₂ Connection, Proposed CO₂ Connection and subsequently the HyNet CO₂ Pipeline.

Other Ancillary Buildings and Structures

- 2.4.16 The following infrastructure is also likely to be required as part of the Proposed Development:
- administration building(s), and stores and workshops – these would contain the main reception, offices, staff welfare facilities and be required for operation and maintenance activities and storage of materials. They would be approximately 3,500 m² in size and at a maximum height of 16 m above ground level, shown as Area 1C on **Plate NTS 6**;
 - electrical control room(s) – these would contain the control room and electrical equipment;
 - above-ground chemical storage tanks – these would be required for the storage of chemicals required for operation of the CQLCP Abated Generating Station;
 - fire pumps;
 - cooling water pumps;
 - above-ground raw and fire water tank;
 - above-ground demineralised water tank;
 - wastewater treatment plant and building;

- permanent laydown areas;
- internal access roads;
- gatehouse(s); and
- parking areas (including electric vehicle chargers).

CO₂ Export and Third-Party Connections

- 2.4.17 The Proposed Development would connect into nearby CO₂ transport and storage (T&S) infrastructure as part of the HyNet industrial cluster, enabling the captured CO₂ to be safely transported to permanent offshore storage facilities in repurposed depleted offshore gas fields.
- 2.4.18 Through a CO₂ pipeline, comprising of existing and new elements, the Proposed Development would make use of CO₂ transport and storage networks owned and operated by Liverpool Bay CCS Limited, currently under development as part of the HyNet Carbon Dioxide Pipeline project (referred to as the 'HyNet CO₂ Pipeline Project'), that will transport CO₂ captured from existing and new industries in North Wales and North-West England, for offshore storage. The onshore pipeline route is shown in **Plate NTS 7** and **Plate NTS 8**.
- 2.4.19 The captured CO₂ would be permanently stored in depleted offshore gas reservoirs in Liverpool Bay (see **Plate NTS 8** for part of the HyNet CO₂ Pipeline Project relevant to the Proposed Development).
- 2.4.20 For the purposes of the electrical connection, NGET, which builds and maintains the electricity transmission networks, is responsible for the operation and maintenance of the existing NGET 400 kV Substation.

Plate NTS 7: Proposed Development Interface with HyNet CO₂ Pipeline Project

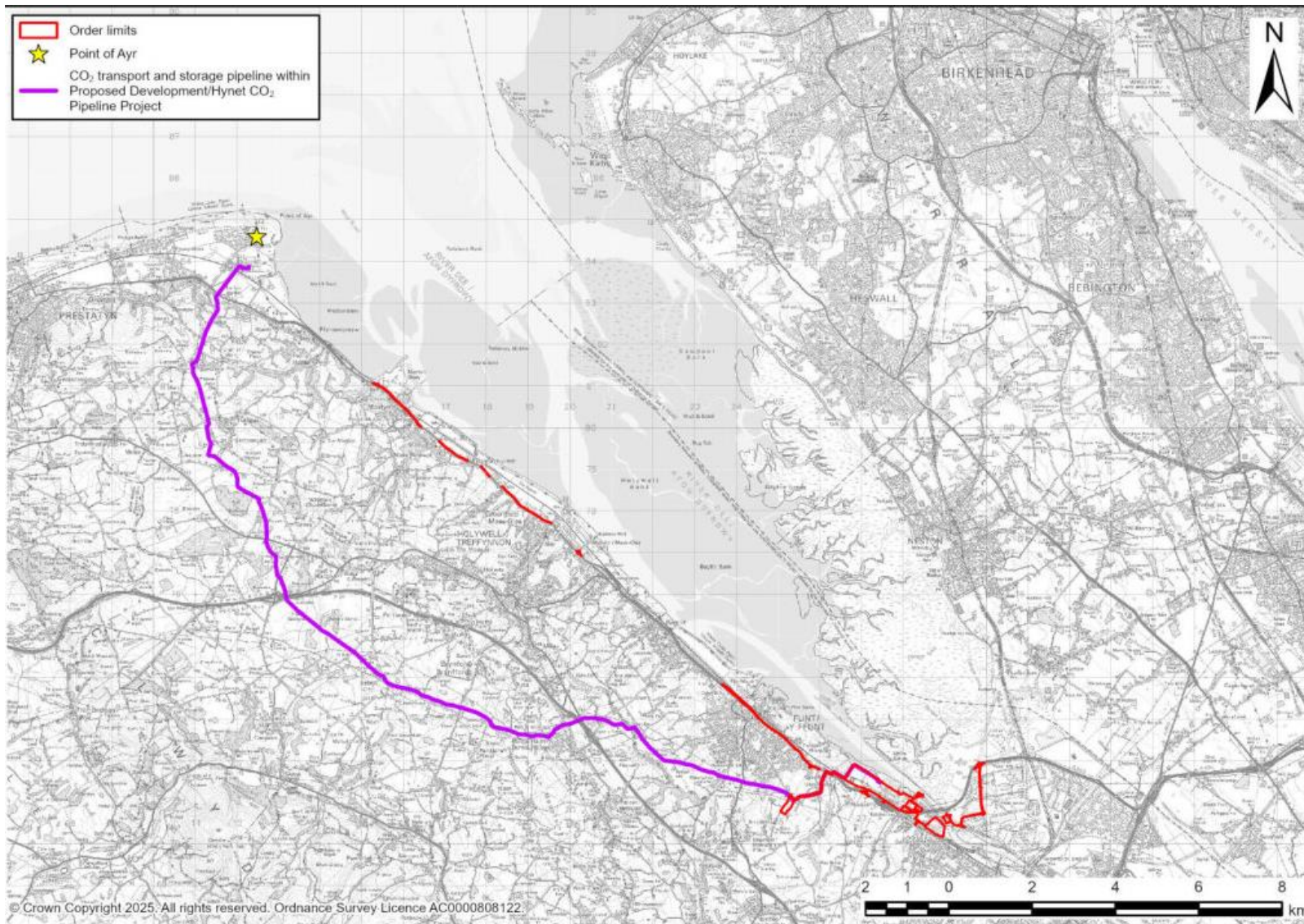
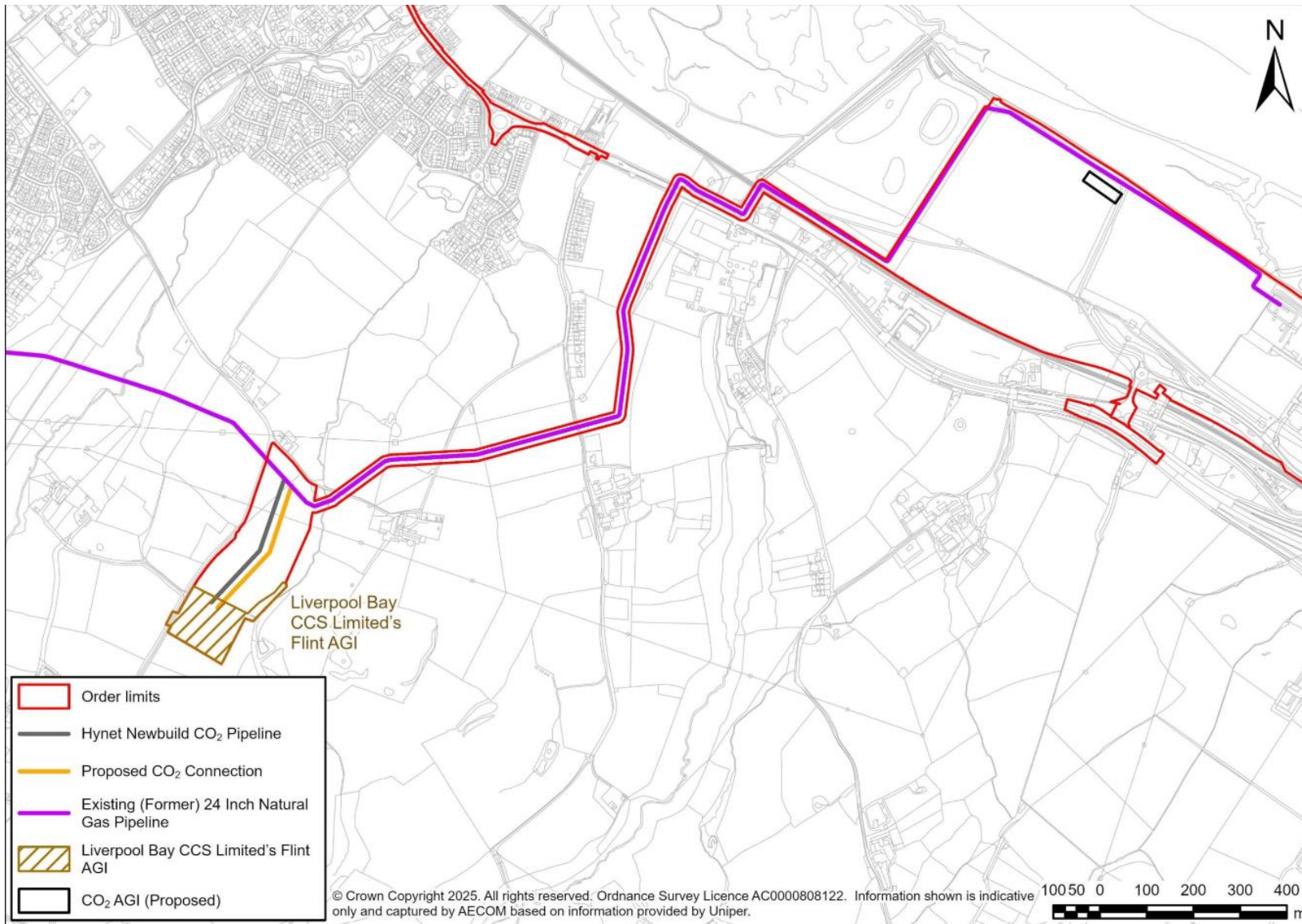


Plate NTS 8: Route for CO₂ Export via the Repurposed CO₂ Connection Corridor from the Main Development Area



Other Connections and Ancillary Infrastructure

2.4.21 A number of other connections and ancillary infrastructure is required to facilitate the Proposed Development. This includes:

- **Natural Gas (Fuel) Connection and Treatment Infrastructure:** this is explained in paragraph 2.3.4;
- **Electrical Connection Works:** In order to export electricity from the Proposed Development, engagement is proposed with NGET to identify any upgrades to existing apparatus that may be required. A new connection would be required from the Train(s) within the Proposed Development to the Applicant's existing 400 kV banking compound, which would be used to connect the Proposed Development to the existing 400 kV NGET substation located south-east of the Main Development Area;
- **Water Connection Works:** The Proposed Development would require a source of cooling water for heat rejection purposes. Subject to minor modification and alteration, the Proposed Development would utilise the existing Connah's Quay Power Station cooling water abstraction and discharge infrastructure located within the River Dee. The Water Connection Corridor shown on **Plate NTS 3** covers the land required for use and repurposing of the existing infrastructure. Process water would also be required in order to provide make-up to the steam / water cycle for the CCGT and CCP. There would also be a requirement for water for domestic and sanitary use;
- **Chemical and material storage:** A number of chemicals would be required to be transported to, stored and used at the CQLCP Abated Generating Station. The extent of the CQLCP Abated Generating Station would therefore contain chemical storage facilities including a road tanker unloading area(s); and
- **Maintenance Laydown Area:** an area to the south-west of the CQLCP Abated Generating Station, within the Main Development Area, would be permanently cleared of vegetation during construction and these areas would be maintained as permanent facilities for laydown and temporary compounds for contractors during periods of routine maintenance.

2.5 Proposed Development Operation

2.5.1 The Proposed Development would operate flexibly during its lifetime with hours of operation driven by the dynamics of the energy market. The CQLCP Abated Generating Station has been designed to be capable of operating 24 hours per day, seven days per week, with programmed offline periods for maintenance.

2.5.2 Operation of the Proposed Development is anticipated to create up to approximately 66 permanent operational roles. During major outages in the operational phase, 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).

- 2.5.3 The operation of the Proposed Development would be regulated by Natural Resources Wales through an Environmental Permit. This permit would be used to control normal emissions to the environment from the plant and would also consider potential abnormal operation scenarios and prevention or minimisation of accidents, through the use of management procedures and process monitoring.
- 2.5.4 During normal daily operation, there would be no venting of captured CO₂ from the Proposed Development. However, some infrequent controlled maintenance activities could require temporary venting of small amounts of CO₂. In the event that venting of CO₂ from the CCP is required (e.g. where the composition of gas is not suitable for the T&S network, or the T&S network is unavailable) it may be necessary to release CO₂. Safe release points would be identified following detailed design and would be controlled via the Environmental Permit for the Proposed Development.
- 2.5.5 The objective of plant maintenance is to ensure the Proposed Development including utility connections operates safely and reliably. Routine maintenance would be planned and scheduled via the maintenance management system with major outages occurring approximately once every four years (per train) depending on the nature of plant operations in that period.

2.6 Design Parameters

- 2.6.1 The design of the Proposed Development has followed an iterative process, based on environmental assessments and consultation and technical engagement with statutory and non-statutory consultees.
- 2.6.2 The final technology selection cannot yet be made as it would be determined by various technical and economic considerations and the contractors selected for the Proposed Development. The design of the Proposed Development therefore incorporates a necessary degree of flexibility to allow for the future selection of the preferred technology in the light of prevailing policy and market conditions once a DCO application has been determined. Where design details are yet to be finalised, a conservative approach has been adopted whereby the option that gives rise to the reasonable worst-case potential environmental impact has been assessed in the ES. This is referred to as the 'Rochdale Envelope' approach.
- 2.6.3 Further detail on the Proposed Development is explained in **Chapter 4: The Proposed Development (EN010166/APP/6.2.4)** of ES Volume II.

3. Construction of the Proposed Development

3.1 Site Enabling Works

- 3.1.1 The construction phase would commence with preliminary works including:
- erecting site fencing (including acoustic fencing) and notices;
 - environmental surveys and ground investigations including any remedial work, if required;
 - demolition and dismantling of the GTP, existing ENI AGI, and existing stores building (and removal of temporary modular structures) within the Main Development Area;
 - site clearance and ground preparation;
 - set-up of contractors' facilities with parking areas, temporary cabins for welfare and office functions accommodated in a mix of temporary modular structures depending on contractor requirements;
 - provision of ecological mitigation measures; and
 - diversion and laying of services (including surface water drainage).
- 3.1.2 The C&IEA would be used during the preliminary works for laydown.
- 3.1.3 Where dewatering is required, if small-scale, this would be via portable pump, discharged to ground. Where large-scale de-watering is required, portable pumps would be used to extract the water into mobile de-silting and water treatment systems.

Construction Laydown Areas and Contractors' Compounds

- 3.1.4 During either the phased or simultaneous construction, sections of the Main Development Area and 10.8 hectares of the C&IEA would be used for dedicated construction laydown over an approximate five year period as follows:
- either side of the existing 400 kilovolts (kV) OHL within the Main Development Area would be fully used for fabrication, laydown, contractor compounds, and wheel-washing facilities;
 - the central area of the C&IEA would be used for contractor compounds, parking and material storage;
 - the outer areas of the C&IEA would be used for contractor parking;
 - the west and north of the laydown area within the Main Development Area would be used for soil storage, with a minimum 30 m wide ecological safeguard zone outside of the laydown area maintained, with 3 m-high acoustic fencing or similar proposed beyond this to the north, west and south boundaries to provide protection for sensitive habitats in the Dee Estuary and residential receptors; and

- a minimum 30 m wide ecological safeguard zone would be provided for laydown areas associated with the C&IEA, with a 3 m-high acoustic barrier on the north-facing and east-facing boundaries and fence hoarding on the south-facing boundary, or similar, is proposed to provide protection for sensitive habitats in the Dee Estuary and residential receptors.
- 3.1.5 Outside of these dedicated laydown areas, there is potential for use of the extents of Train 1 and Train 2 to be used wholly or in part for temporary laydown. This would be throughout the construction phase in advance of construction of specific assets and structures within these areas, subject to the detailed programme of construction.
- 3.1.6 Additionally, the extent of the Maintenance Laydown Area may be used for temporary laydown throughout the construction phase both in advance and following construction of the Maintenance Laydown Area as described in **Chapter 4: The Proposed Development (EN010166/APP/6.2.4)**.
- 3.1.7 Within the Proposed CO₂ Connection Corridor, a contractor compound and laydown area would be located in proximity to the Liverpool Bay CCS Limited's Flint AGI. Full use of approximately 0.4 ha of the Proposed CO₂ Connection corridor would be required for material laydown, storage, fabrication and contractor parking for approximately nine months. Access is to be provided via a combination of existing field accesses and/or the access to be constructed for the Liverpool Bay CCS Limited's Flint AGI itself.

Earthworks

- 3.1.8 During the construction phase, earthworks would be required to reprofile areas of the Main Development Area to produce a level platform, excavate foundations and/ or remove surplus material or remediate contaminated soils. A material cut and fill balance would be used to minimise waste arisings. However, it is anticipated that some import / export of materials would also be necessary to provide a suitable foundation platform for the Main Development Area.

3.2 Main Works

CQLCP Abated Generating Station

- 3.2.1 The contractor would prepare and level the Main Development Area, followed by piling (if required) and excavation for main foundations, e.g. absorber stack, HRSG and turbine hall.
- 3.2.2 Plant and related infrastructure for the CQLCP Abated Generating Station would be pre-fabricated off-site, where possible. It is anticipated that certain larger items of plant may need to be fabricated and erected on-site due to their anticipated size or weight. These include:
- direct contact cooler (DCC);
 - absorber column(s);
 - CO₂ stripper(s);
 - storage tanks; and

- HRSG.

Construction associated with the natural gas connection

- 3.2.3 The import of natural gas from the NTS for use in the proposed CCGT plant would use an existing natural gas connection. This existing natural gas connection comprises a 750 mm, approximately 2.5 km long natural gas pipeline (the Dee Pipeline) from the Applicant's existing Connah's Quay AGI.
- 3.2.4 The Dee Pipeline is owned and operated by the Applicant. National Grid Gas also operates apparatus related to metering and valving at the Burton Point AGI.
- 3.2.5 More information can be found in the **Gas Connection Statement (EN010166/APP/7.3)**.

Construction associated with Electrical Connection Corridor

- 3.2.6 At this stage, no modifications or works are expected within the Electrical Connection Corridor, but this is subject to confirmation by NGET. Minor works such as additional protection/safety equipment or monitoring equipment may be required within the Electrical Connection Corridor, below-ground and within existing cable conduits, but this is subject to NGET confirmation. The timing, location and construction of the Electrical Connection would be determined in consultation with NGET and the National Grid Energy System Operator (ESO).
- 3.2.7 Further details of the works associated with the electricity connection for the Proposed Development are provided in the **Electricity Grid Connection Statement (EN010166/APP/7.2)** and **Indicative Electrical Connection Plans (EN010166/APP/7.16)**.

Construction within Water Connection Corridor

- 3.2.8 Cooling water for the Proposed Development would be abstracted from and discharged to the River Dee within the Water Connection Corridor, in line with the current process for the existing Connah's Quay Power Station. The Proposed Development would utilise the existing cooling water abstraction and discharge infrastructure with minor additions and refurbishment at the intake to meet current legislative requirements, including The Eels (England and Wales) Regulations 2009 (Ref. 18) (Eels Regulations).

Construction within Surface Water Outfall Area

- 3.2.9 The existing Connah's Quay Power Station surface water outfall is located to the eastern side of the Rockcliffe culvert and within the Dee Estuary.
- 3.2.10 The Existing Surface Water Outfall may require maintenance works, including clearing debris / repairs to the existing surfaces so that it is suitable for continued use alongside the Proposed Development.
- 3.2.11 Additionally, construction of a new permanent outfall structure for surface water drainage discharge from the Main Development Area (the Proposed Surface Water Outfall) would be undertaken adjacent to the Existing Surface Water Outfall.

3.2.12 The Proposed Surface Water Outfall would connect to and be downstream of a surface water drainage network within the Main Development Area as detailed in **Appendix 13-D: Outline Drainage Strategy (EN010166/APP/6.4)**.

3.2.13 A 10 m buffer around the existing artificial structure (the Surface Water Outfall Area) has been included to allow for access and works if required, including the footprint of the Proposed Surface Water Outfall.

Construction within Proposed CO₂ Connection Corridor

3.2.14 A new pipeline approximately 422 m in length would be constructed. This would transport the captured CO₂ emissions from the Proposed Development to the Liverpool Bay CCS Limited's Flint AGI (which is part of the HyNet CO₂ Pipeline Project) before entering the HyNet CO₂ Pipeline.

3.2.15 The pipeline would be installed by open cut methods excavating to a required depth of approximately 2 m. The excavated spoil would be stored adjacent to the trench whilst the pipeline is laid, before being reinstated once the pipeline is installed. Any surplus excavated material would be reused within the Construction and Operation Area.

3.2.16 A temporary diversion of Flintshire County Council (FCC) Public Right of Way (PRoW) No. 66 would be required in order to facilitate construction of the Proposed CO₂ Connection pipeline where they intersect. It is anticipated that the diversion would be required for up to nine months and would follow a route within the same field. No permanent change to this PRoW is proposed and the original access would be reinstated following construction.

Construction Staff

3.2.17 Based on initial estimates, it is considered that there could be approximately 1,000 construction personnel contracted to work on the Main Development Area and C&IEA at the peak of construction for each phase (Phase 1 or 2). If a simultaneous construction approach is adopted, it is anticipated that peak construction numbers could be approximately 1,600 construction personnel.

Construction Working Hours

3.2.18 Core construction working hours would be 08:00 to 18:00 Monday to Friday (except bank holidays) and 08:00 to 13:00 on Saturdays. The Applicant will agree with FCC any necessary protocols to ensure that impacts are kept to a minimum, if any works are required to be undertaken outside of core construction hours.

Construction Traffic and Site Access

3.2.19 Access to the Main Development Area for both construction workers and heavy goods vehicles (HGV) traffic would be via the site access for the existing Connah's Quay Power Station (Access to Main Development Area) from Kelsterton Road. No works to the existing roadway are expected to be required to facilitate access for construction workers and HGV via the Access to Main Development Area and public highway layout.

3.2.20 AIL, formed of the largest components that cannot be disassembled for transport, will be transported initially by sea to one or more of the three offloading locations options:

- Port of Mostyn (operational port); or
- Connah's Quay North (existing commercial offloading facility); or
- Ellesmere Port (operational port).

Port of Mostyn (operational port)

3.2.21 The Port of Mostyn is an existing support hub for the offshore wind sector and includes 'Mostyn Energy Park' with a long-standing history of handling AIL. The Port of Mostyn has received consent for an expansion of facilities, in order to continue to service the offshore wind sector (the Mostyn Energy Park Extension (MEPE) Project). As a result, it is anticipated that additional berthing and roll on roll off facilities could be available for use during construction of the Proposed Development. Accommodation works that may be required at the Port of Mostyn include minor works (removal of gate post and tree works) in the vicinity of the Port Level Crossing. This would be to allow for adequate visibility for AIL's entering and exiting the Port of Mostyn. The Port of Mostyn allow direct access to the A548, respectively.

Connah's Quay North (existing commercial offloading facility)

3.2.22 Connah's Quay North (CQN) is the closest existing jetty to the Main Development Area and has a history as an AIL offloading facility. AIL would be offloaded using roll-on, roll-off and temporary link span, SPMTs or similar would use the existing private road network (River Road, North Road and roundabout), where AILs would use the first exit onto British Steel Road which is in part a private road, heading north, directly to the A548 roundabout/Weighbridge Road junction. From the A548 / Weighbridge Road roundabout, the AILs would use the A548, passing over Flint Bridge. In order to access the Main Development Area, it would be necessary to temporarily remove the central reserve barrier in the A548 Chester Road, to provide the required swept path onto the Main Development Area Access Works Area directly from the westbound carriageway. AILs up to 6 m wide, 6 m high, and 30 m long (relative to the roadway) may be accommodated from Connah's Quay North, given existing road network constraints.

3.2.23 However, to facilitate a similar operation, an expansion to the existing area of hardstanding is required. The expansion would be divided into two sections around an existing area of hardstanding, one approximately 50 m by 16 m (800 m²) and another 62.5 m by 16 m (1,000 m²) as identified on **Plate NTS 9**. The expanded area would provide the necessary flexibility for equipment deliveries during the construction phase once final delivery sizes are confirmed. Once AIL deliveries are complete, the area will be vacated by the Applicant and made available for future use by the landowner, Tata Steel UK Limited. The land may or may not be reinstated to its current condition at that stage. Each technical topic in the ES has considered the relevant worst-case scenario for the expansion.

3.2.24 Use of this option is subject to the assessment of the clearance and required safety distances of the 400 kV High Voltage (HV) OHL present at Connah's

Quay North. There are also HV OHL present on the A548 on the route to the A548 AIL access.

- 3.2.25 Accommodation works at the quayside includes connection to the moorings, placement of mobile cranes or temporary link span for the roll-on, roll-off, carriageway accommodation works to the private road network within the Deeside Industrial Estate, unclassified roads and the adopted highway as well as temporary works to re-mound and remount gates / post at the security entrance.
- 3.2.26 Temporary accommodation works to tree branches, to lift overhead wires, or to temporarily remove street signs/lights/furniture may be required on the A548 and unclassified roads near CQN to facilitate transport of AILs. A reinstated junction on the A548 would form a direct connection from the A548 to the existing access to the Main Development Area, via a temporary gap in the central reservation to ease turning.

Ellesmere Port (operational port)

- 3.2.27 Port of Ellesmere (PoE) (Manchester Ship Canal) is also under consideration for shipborne deliveries of AIL. The port is 22 km north-west of the Main Development Area and has a history of use for AIL, including reception of a furnace in 2022 for onward transport via the highway and local road network to Stanlow. No accommodation works to facilitate AIL delivery or transport would be required at PoE for the size restricted loads anticipated to be delivered to this port and therefore no part of PoE is included within the Order limits.
- 3.2.28 The route length from PoE to the Main Development Area is 22 km via the A6032 Merseyton Road to the M53 junction 9 Rossmore Road Interchange north-westbound (Option 1) or south-eastbound (Option 2), as shown on **Plate NTS 4**.
- 3.2.29 Further details on the Construction of the Proposed Development are included within **Chapter 5: Construction Programme and Management (EN010166/APP/6.2.5)** of ES Volume II.

3.3 Construction Methodology

- 3.3.1 The Applicant would appoint one or more contractors for the construction of the Proposed Development. The Applicant is committed to creating a safe working environment for all its employees and contractors.
- 3.3.2 Construction would be undertaken in accordance with relevant safety requirements and regulations.
- 3.3.3 It is possible that the two Trains would be constructed in a phased approach. Under this phased approach, it is anticipated that construction of a single CCGT and CCP together with cooling and CO₂ compression infrastructure and associated development (herein referred to as 'Train 1, Phase 1'), could commence in 2026, and last approximately four years. The construction of a similar 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 but form

a reasonable worst-case assumption for the purposes of technical assessment.

3.3.4 For each of the technical assessments in the ES, a reasonable worst-case is assumed. For some assessments, this includes consideration of:

- potential for a phased construction where Train 1 is constructed initially, followed by Train 2; and/or
- potential for Train 1 and Train 2 to be constructed during a single phase (herein referred to as 'simultaneous construction'); and/or
- construction commencing as late as 2031 as the DCO application seeks consent for the commencement of the Proposed Development to take place up to five years from the date of granting of the DCO (depending on market needs and financing).

Lighting Controls

3.3.5 Construction temporary site lighting is proposed to enable safe working on the construction site in the hours of darkness. Construction temporary lighting will be arranged so that glare is minimised outside the construction site. The appointed contractors will be responsible for establishing the required approach to and levels of lighting in accordance with the **Lighting Strategy (EN010166/APP/7.22)**. The strategy seeks to provide safe working conditions during construction whilst reducing light pollution and the visual impact of light on the local environment.

Site Restoration / Reinstatement

3.3.6 Following construction, temporary construction plant and equipment would be removed and the ground reinstated. Topsoil would be reinstated where this has been stored during construction following topsoil stripping. The overall objective is that the parts of the Construction and Operation Area required only for construction (with no residual environmental and/ or safety risks) would be reinstated in accordance with the **Outline LEMP (EN010166/APP/6.9)** to a condition suitable for re-use.

3.4 Proposed Development Decommissioning

- 3.4.1 It is envisaged that the power generation and carbon capture elements of the Proposed Development would have an initial design and operational life of up to 30 years; therefore, decommissioning activities are currently anticipated to not commence until after 2060 or 2065.
- 3.4.2 Any future decision to extend its lifespan would be subject to the Applicant undertaking a financial investment decision based on a number of factors, such as safety and the regulatory requirements at that time.
- 3.4.3 At the end of its operational life, the Proposed Development would be shut down, with all above-ground structures on the Main Development Area removed, and the ground remediated as required to facilitate future re-use. It is also assumed that cooling water infrastructure within the Dee Estuary and all buried assets of the Proposed Development would be left in-situ and the associated pipework treated and filled.
- 3.4.4 Any demolition contractor would have a legal obligation to consider decommissioning and demolition under the Construction (Design and Management) Regulations 2015, or the equivalent prevailing legislation at that time.
- 3.4.5 It is anticipated that timescales for decommissioning and demolition of the Proposed Development could be similar to, or slightly shorter than, its construction and would require provision of office accommodation and welfare facilities.
- 3.4.6 A Decommissioning Environmental Management Plan (DEMP) will be produced at the time of decommissioning and include an outline programme of works. This would consider all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed, accounting for potential future changes to baseline conditions. This would include procedure on how surface water drainage should be managed during decommissioning and demolition.

4. Consideration of Alternatives

4.1.1 **Chapter 6: Project Alternatives (EN010166/APP/6.2.6)** of ES Volume II sets out the main alternatives that have been considered in relation to the Proposed Development. An iterative site selection process has been undertaken as well as a design refinement process considering reasonable alternatives. Alternatives have been considered during the evolution of the Proposed Development including:

- the 'do nothing' and 'do minimum' scenarios;
- alternative site locations;
- alternative designs, including alternative technologies; and
- alternative layouts.

4.2 The 'Do Nothing' and 'Do Minimum' Scenarios

4.2.1 The 'Do Nothing' scenario would mean the Proposed Development is not taken forward. This would result in the loss of generating capacity after the closure of the existing Connah's Quay Power Station. This would not align with the established national need for new low carbon energy infrastructure and the status of the Proposed Development as a Critical National Priority (CNP).

4.2.2 The Applicant also considered a Do Minimum scenario of installing Carbon Capture Plant (CCP) infrastructure to the existing Connah's Quay Power Station. This option would require the upgrade and replacement of internal components, plant and other equipment alongside the construction of other new infrastructure, including new stacks. This option was not considered to align with the Proposed Development's Objectives.

4.2.3 It was concluded that both the Do Nothing and Do Minimum Scenarios do not present a reasonable alternative to the Proposed Development.

4.3 Alternative Site Locations

4.3.1 For the Main Development Area, alternative site locations within the existing Connah's Quay Power Station site were considered including replacement in situ (a direct replacement of the existing Connah's Quay Power Station), a north site and a south site. The 'north' site is the largest of the three areas at 24 hectares, and is physically constrained by overhead power cables, pipes and a gas pipeline. The south site is smaller, at 9.5 hectares which is also constrained with overhead power cables and other electrical transmission infrastructure and proximity to the North Wales Main Line railway line.

4.3.2 Each of these locations were considered by the Applicant in terms of land availability, technical feasibility such as the ease of construction and operation, financial viability and environmental constraints, and whether there were likely to be significant environmental effect as a result of the construction, operation or decommissioning of the Proposed Development.

4.3.3 The north site was selected for the following key reasons, and is referred to as the Main Development Area in the ES:

- it allows project construction and delivery such that dispatchable, low carbon, power can be delivered from 2030, securing commercial viability;
- it maximises potential to fulfil policy need for dispatchable, low carbon power;
- it reduces proximity of the Proposed Development to receptors in Connah's Quay;
- it allows continued generation from the existing Connah's Quay Power Station during the construction period of the Proposed Development;
- the land area offers the potential for the Proposed Development to maximise the use of the connection to the national grid;
- it offers good proximity to existing natural gas connection;
- it offers good proximity to the proposed CO₂ export corridor;
- it offers good proximity to cooling water infrastructure; and
- it optimises the provision of laydown and construction areas.

4.3.4 It was also later determined that the south site would be required to facilitate the construction of the Proposed Development within the north site. The south site is referred to within the ES as the C&IEA.

4.3.5 The Proposed Development includes an appropriate degree of flexibility for a number of technical parameters that have yet to be finalised. The design process and feedback from the EIA process will continue to iteratively assess and improve upon the design of the Proposed Development, within the parameters assessed.

4.4 Alternative Design including alternative technologies

Alternative Technologies

4.4.1 The Applicant undertook a review of all possible technology options which could provide the generation of low carbon power.

4.4.2 The Applicant considered:

- technical feasibility of available infrastructure at the existing Connah's Quay Power Station site;
- technical and financial viability of technology options;
- sequencing with the HyNet Carbon Capture Underground Storage (CCUS) Cluster;
- emerging government business models to incentivise energy with CCS/CCUS development; and
- potential for the Proposed Development to be operational by 2030.

4.4.3 A CCGT generating station was selected as the preferred basis of design by the Applicant as it is supported by paragraph 3.3.17 of NPS EN-1 which

notes the importance of quick start peaking capacity, which the Proposed Development would provide.

- 4.4.4 Alternative power generation cycles using carbon capture were investigated, but were not considered technically mature enough to be ready for operation by 2030 and so do not meet national energy goals.
- 4.4.5 Hydrogen fired power generation technology, whilst having the potential to deliver against these same policy goals, is not technically mature on large utility scale power plant and is also not currently adequately supported through funding schemes. Therefore, that technology also cannot currently be considered for commercial deployment in the timeline required for 2030 operation.

Alternative Design

- 4.4.6 Following the completion of a techno-economic assessment, a CCGT generating station was selected. These are suitable for generating low carbon electricity through a post-combustion CCP. This is supported by national planning policy.
- 4.4.7 The indicative linear layout of the Trains within the Main Development Area was selected to reduce the potential visual impact of the Proposed Development by grouping the elements with the greatest above ground height in close proximity to each other.
- 4.4.8 A number of design changes were made throughout the design stages to date due to further technical studies and assessment as well as in response to comments received during consultation. These are explained in detail within **Chapter 6: Project Alternatives (EN010166/APP/6.2.6)** of ES Volume II. A summary of the key design changes included:
- **reduction of the Order limits to remove the ports:** after further routing analysis and engagement with the Port of Mostyn and Ellesmere Port, it was confirmed that neither Port would require temporary mobile cranes or laydown areas within the Ports themselves to facilitate the Proposed Development. Therefore, the Order limits were reduced in these areas;
 - **reduction in number of absorber stacks required and removal of blast stacks:** the number of absorber stacks has been reduced from two to one per train and the blast stacks have been removed from design entirely; and
 - **building height changes:** the CCGT and HRGS buildings were also increased in size with maximum height increasing from 32 m above ground level and 42 m above ground level respectively, to both be up to 50 m above ground level.
- 4.4.9 As set out in the **Change Application Report (EN010166/APP/10.1)**, further design changes have been made. These include:
- The CCP Absorber Stack(s), the HRSG Stack(s), and CCP Absorbers have been reduced to a maximum height of 145 m, 130 m and 92 m above ground level, respectively, in order to avoid infringement of the

Outer Horizontal Surface and Obstacle Limitation Surface associated with aviation safety of Hawarden Aerodrome.

5. Consultation

5.1 Overview

- 5.1.1 As part of the DCO process it is a statutory requirement to consult with stakeholders and the local community about the proposed development and obtain feedback in order to further improve the design of the Proposed Development.
- 5.1.2 A series of pre-application consultations were carried out for the Proposed Development, these included:
- non-statutory consultation – February to March 2024;
 - statutory consultation – October to November 2024; and
 - targeted consultation – May to June 2025.
- 5.1.3 In addition to these main consultation periods, continued stakeholder engagement has taken place with key stakeholders, Local Planning Authorities and PINS throughout the pre-application period. The purpose of this engagement was to provide updates and take on board feedback from stakeholders in order to inform the emerging design of the Proposed Development and the EIA.
- 5.1.4 Following submission of the DCO Application, a voluntary consultation was undertaken on changes to the Application in line with the consultation proposals set out in the **Change Notification [AS-006]** and **Change Notification – Appendices [AS-007]**. This consultation ran from Wednesday 21 January 2026 to Wednesday 18 February 2026, and is referred to as the 'Change Consultation'.
- 5.1.5 It is acknowledged how valuable the consultation and engagement process is to the success of any project. Consultation feedback received has directly fed into the design process and has helped influence the design of the Proposed Development.

5.2 Non-statutory Consultation

- 5.2.1 The non-statutory consultation was carried out between 26 February and 25 March 2024. Three in-person events were held in early March 2024, as well as two online webinars. Feedback was sought during this consultation on the need for the Proposed Development, the Proposed Development Site, the studies and assessment for the EIA, local issues and sensitivities and any additional measures that should be considered.

5.3 Statutory Consultation

- 5.3.1 The Statutory Consultation was carried out between 8 October 2024 and 19 November 2024, during which time the Applicant hosted a number of in-person and online events. The Statutory Consultation included the publication of the Preliminary Environmental Information (PEI) Report, the feedback on which has been considered within this ES.

5.3.2 The **Consultation Report (EN010166/APP/5.1)** describes the approach taken and the outcomes of consultation and wider stakeholder engagement activities throughout the pre-application stage.

5.3.3 Comments from statutory bodies on the environmental aspects of the Proposed Development have been included within the relevant technical chapters of ES Volume II (**Chapters 8 to 24, EN010166/APP/6.2**) to show how and where comments from the Statutory Consultation and other engagement with stakeholders have been addressed within the ES.

5.4 Targeted Consultation

5.4.1 A non-statutory targeted consultation was held between 8 May and 6 June 2025 on changes to the original design consulted on during the Statutory Consultation. Views were sought on the following changes:

- **HRSG Stack heights:** The maximum height would be 150 m above ground level (presented as 85 m at Statutory Consultation); and
- **Absorber Emission Stack heights:** The maximum height presented would be 150 m above ground level (presented at 120 m at Statutory Consultation).

5.4.2 Other non-material changes were also presented. Details of feedback received to the Targeted Consultation and the Applicant's response are provided within the **Consultation Report (EN010166/APP/5.1)**.

5.5 Change Consultation

5.5.1 The Applicant carried out a voluntary consultation on the following changes to the DCO Application (**Change Application Consultation Report (EN010166/APP/10.2)**):

- **Reduction of land acquisition powers**
Land requirements within the CO₂ Connection Corridor have been reduced. Permanent acquisition is no longer needed for the Flint AGI land; only subsurface rights and associated access/protection rights are required, aligning with powers already granted under the HyNet CO₂ Pipeline Project.
- **Alignment of landscape plans**
The CO₂ Connection Corridor Indicative Landscape Plan has been updated to match the landscaping plans already approved for the HyNet CO₂ Pipeline Project.
- **Land designation adjustment**
Seven areas previously identified as retained habitat within the Connah's Quay Power Station have been reclassified as permanent habitat loss to allow ongoing operational use and future laydown activities.
- **Reduction in structure heights**
The maximum heights of the HRSG Stack(s), CCP Absorber Stack(s), and CCP Absorbers have been reduced to 130 m, 145 m, and 92 m above ground level, respectively, to avoid conflicts with aviation safety surfaces at Hawarden Aerodrome.

- **Relocation of contractors' facilities**
The proposed location of the contractors' facilities has been moved to a different location within the Main Development Area after confirming the originally proposed area cannot accommodate them.
- **Expansion of hardstanding at North Jetty**
Expansion of the hardstanding area (approximately 1,800 m²) at Connah's Quay North Jetty to improve equipment unloading, construction logistics, and temporary laydown capacity.

5.5.2 Details of feedback received to the Change Consultation and the Applicant's response are provided within the **Change Application Consultation Report (EN010166/APP/10.2)**.

6. Location of the Proposed Development

6.1 The Existing Site and Surroundings

- 6.1.1 The Proposed Development is located approximately 0.6 kilometres (km) north-west of Connah's Quay in Flintshire, north-east Wales and lies within the Flintshire County Council (FCC) administrative area.
- 6.1.2 The Order limits, as shown in **Plate NTS 1** encompass a total area of approximately 105.11 hectares (ha).
- 6.1.3 Around 86.33 ha of the Order limits is focused on the 'Construction and Operation Area', comprising the Main Development Area, construction areas and connection corridors necessary for the construction and operation of the Proposed Development shown in **Plate NTS 1**. A further 18.78 ha of land included for the 'Accommodation Works Areas', comprising areas of works required to facilitate the movement and temporary storage of AIL during construction of the Proposed Development.
- 6.1.4 The Main Development Area includes the existing Connah's Quay Power Station site, owned and operated by the Applicant, and adjacent land for the purposes of facilitating connections to the Proposed Development for gas, electricity, water and other necessary infrastructure. A view of the existing Connah's Quay Power Station looking south-west from across the Dee Estuary is shown in **Plate NTS 10**.
- 6.1.5 The town of Connah's Quay is located to the south-east of the existing Connah's Quay Power Station and the Main Development Area, immediately beyond the A548 and the North Wales Main Line railway. The area to the south-west of the Main Development Area, shown on **Plate NTS 11**, is mainly used for pastoral agriculture with some arable agriculture while the area to the north-west of the Main Development Area is a nature reserve within several statutory designated sites.

Plate NTS 9: Order limits (Excluding the Accommodation Work Areas)

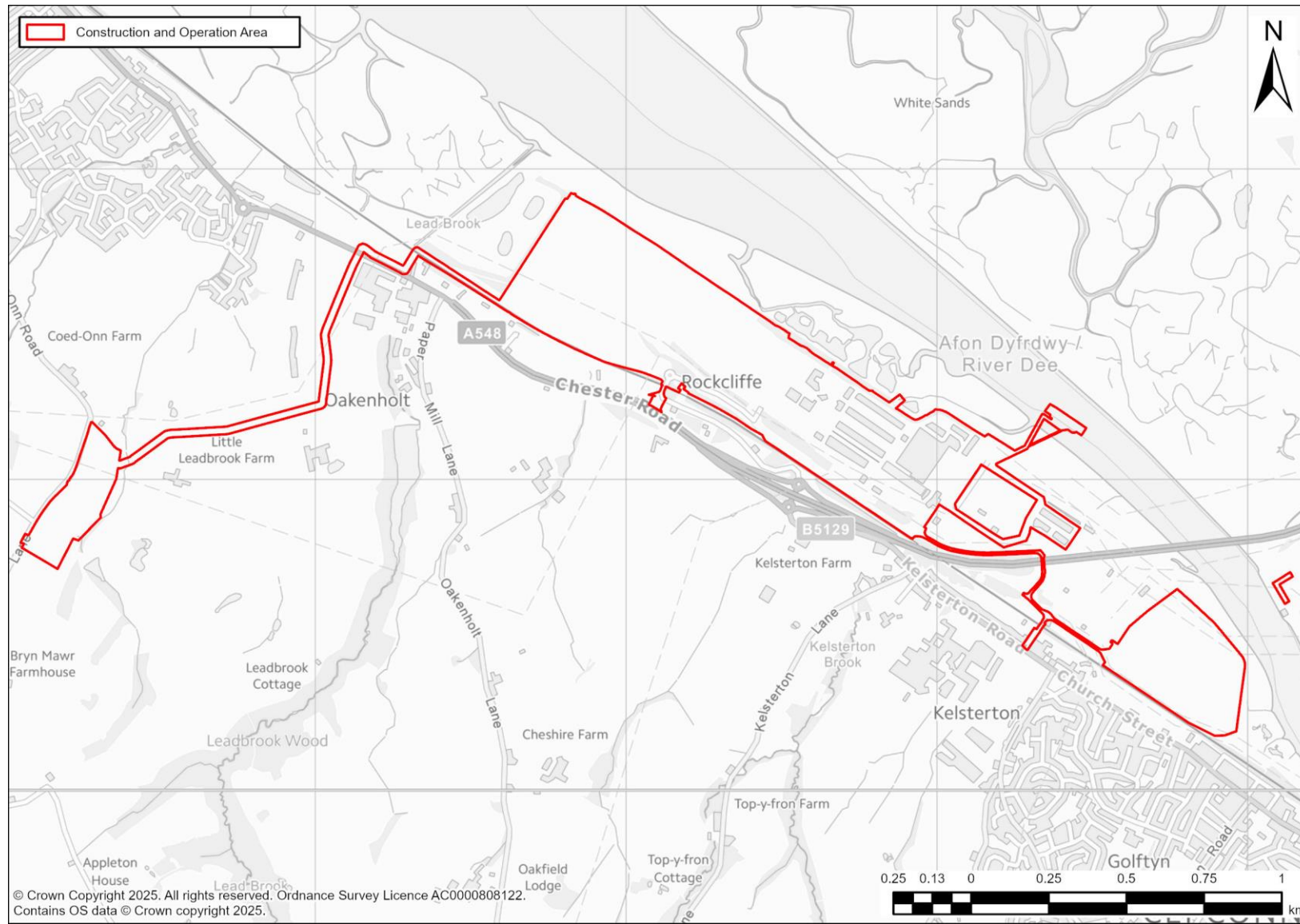
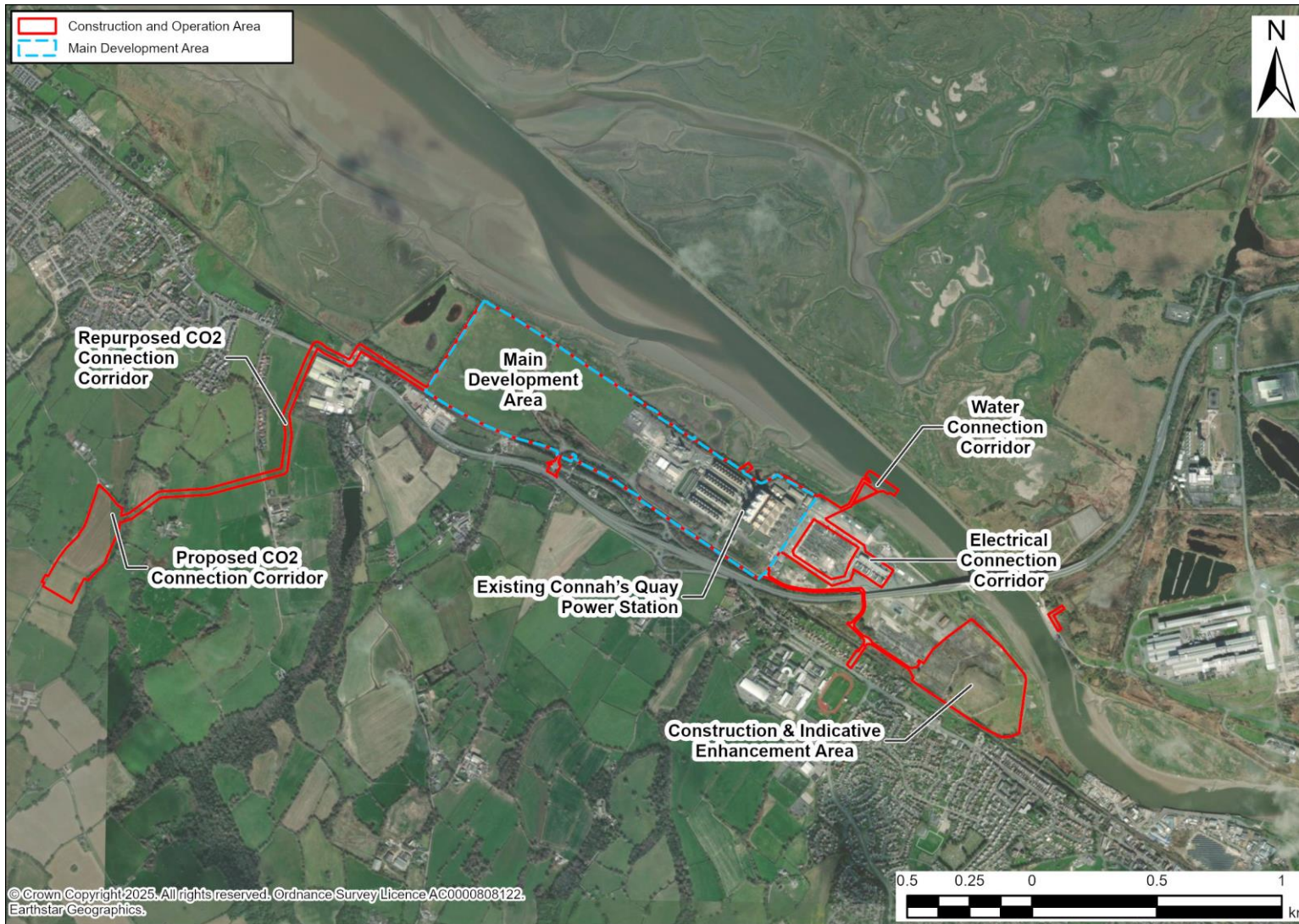


Plate NTS 10: Existing Connah's Quay Power Station (view from Dee Estuary)



Plate NTS 11: Aerial View Centered on Construction and Operation Area



6.2 Potential Sensitive Receptors

- 6.2.1 A number of environmental receptors have been identified within the vicinity of the Proposed Development for each environmental topic assessed and are described in more detail in **Chapter 3: Location of the Proposed Development (EN010166/APP/6.2.3)** of ES Volume II. Distances are provided as the shortest distance between the receptor and the closest relevant point of the Order limits.
- 6.2.2 Key receptors for each topic area have been identified as part of the assessment process and details are included in the relevant technical chapters (**Chapters 8 to 23, EN010166/APP/6.2**) of ES Volume II. A brief summary is also provided below.

Residential Receptors

- 6.2.3 The nearest residential receptors to the Main Development Area are located along Kelsterton Road, with the closest receptor being approximately 20 m from the Main Development Area and within 100 m of the C&IEA and the Proposed CO₂ Connection Corridor. Additional residential receptors are also located along Kelsterton Road, including a travellers' encampment, beyond this distance.
- 6.2.4 The nearest main settlement is the town of Connah's Quay, the approximate centre is located approximately 0.94 km south of the C&IEA at its closest point and approximately 2.1 km south-east of the Main Development Area though residential areas of the settlement reach to within approximately 25 m from the Order limits and within approximately 90 m of the Main Development Area.
- 6.2.5 Other nearby settlements to the Order limits include:
- the village of Oakenholt, the approximate centre of which is located approximately 375 m east of the Repurposed CO₂ Corridor. The Repurposed CO₂ Connection Corridor passes within the village and there is a residential property approximately 375 m west of the Main Development Area;
 - the village of Flint Mountain, the approximate centre of which is approximately 1.1 km south-west of the Proposed CO₂ Connection Corridor;
 - the town of Flint, the approximate centre of which is approximately 2 km north-west of the Proposed CO₂ Connection Corridor, though residential areas of the settlement reach to within approximately 75m of the Repurposed CO₂ Connection Corridor; and
 - the village of Northop Hall, the approximate centre of which is approximately 3.1 km south-west of the C&IEA.
- 6.2.6 Residential Receptors within 250 m of the Accommodation Work Areas include:
- a large number of residential properties are within 50 m of the Order limits on the A548 from Port of Mostyn to Greenfield Accommodation

Works. This includes those on the A548 itself as well as adjoining local roads;

- there are residential properties along Tir Glas and Bagllit Road located within 50 m of the Order limits at the Tir Glas Roundabout Accommodation Works;
- a large number of residential properties within 50 m of the Order limits at the A548 through Flint to Chester Road Roundabout Accommodation Works. This includes those on the A548 itself as well as adjoining local roads, including Llys Cadfan and Llys Collen;
- residential properties, including a traveller's site along Kelsterton Road and residential properties on Rockliffe Lane are within 50 m of the Order limits at the AIL Access Accommodation Work Areas;
- there are no residential properties within 250 m of the Connah's Quay North Accommodation Works Area; and
- there are no residential properties within 250 m of the North Road to A548 Accommodation Works Area.

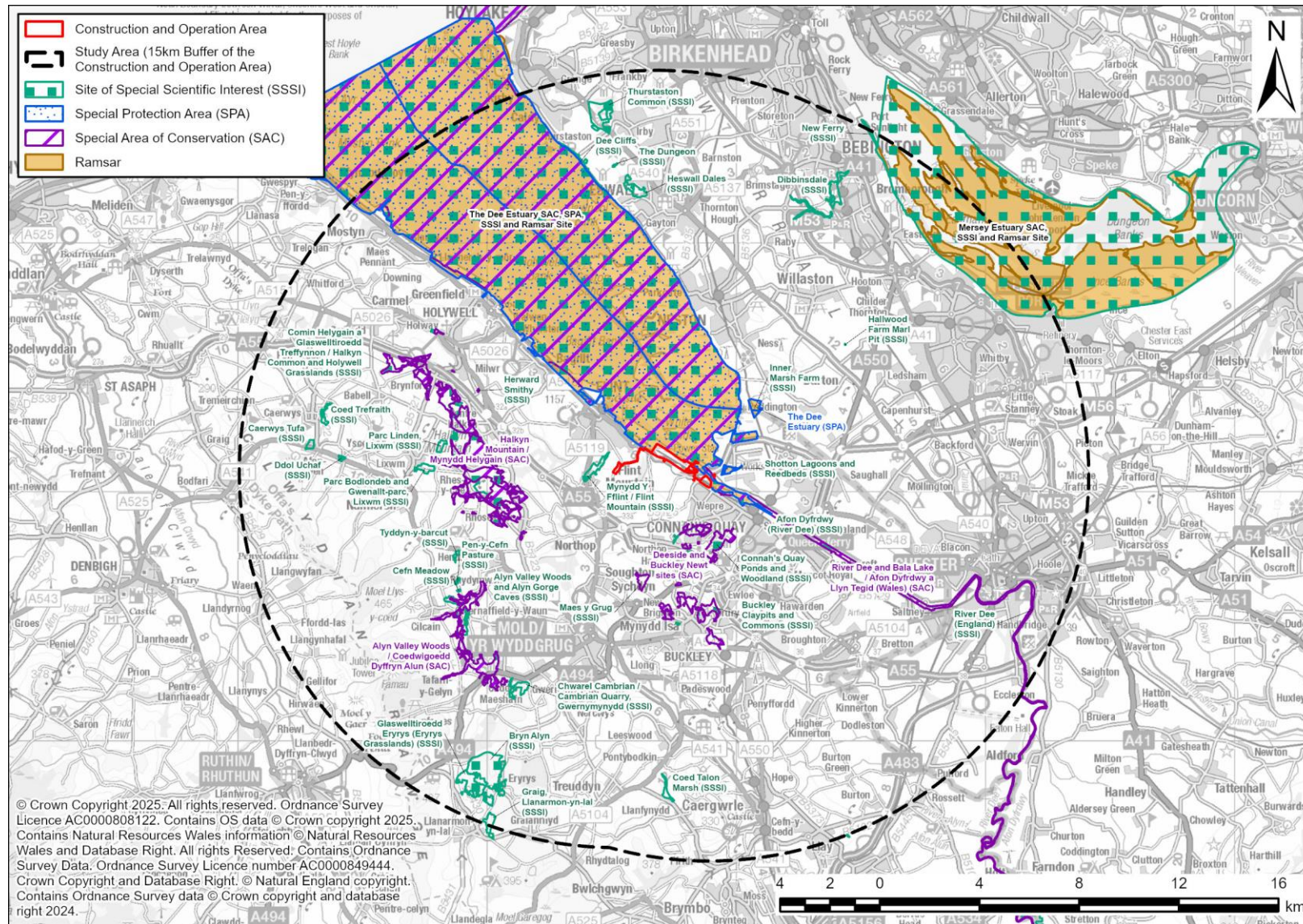
Terrestrial Ecological Receptors

6.2.7 There are six statutory designated ecology sites within 2 km of the Construction and Operation Area. These are shown on **Plate NTS 12** and comprise:

- Dee Estuary / Aber Dyfrdwy (Wales) Special Area of Conservation (SAC), which is located adjacent to the Main Development Area and within the Water Connection Corridor, and Surface Water Outfall Area;
- the Dee Estuary (Wales) Special Protection Area (SPA), which is located adjacent to the Main Development Area and within the Water Connection Corridor, and Surface Water Outfall Area;
- the Dee Estuary (Wales) Ramsar, which is located adjacent to the Main Development Area and within the Water Connection Corridor, and Surface Water Outfall Area;
- Dee Estuary / Aber Afon Dyfrdwy (Wales) Site of Special Scientific Interest (SSSI), which is located adjacent to the Main Development Area and within the Water Connection Corridor, and Surface Water Outfall Area;
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC, which is located approximately 250 m from the Water Connection Corridor and 520 m from the Main Development Area; and
- Deeside and Buckley Newt sites SAC, which is located approximately 1.47 km from the C&IEA and 2.12 km from the Main Development Area.

6.2.8 There are a further 33 Statutory Ecological Designations within 15 km of the Construction and Operation Area. Further details are presented in **Chapter 11: Terrestrial and Aquatic Ecology (EN010166/APP/6.2.11)** of ES Volume II.

Plate NTS 12: Statutory Ecological Designations



Marine Ecological Receptors

6.2.9 Marine ecological receptors have been identified due their proximity from the Water Connection Corridor. There are:

- The Dee Estuary (Aber Dyfrdwy) SAC / RAMSAR / SSSI (located within the Water Connection Corridor) designated for a number of marine habitats and lamprey species;
- River Dee and Bala Lake SAC (located adjacent to the Water Connection Corridor) designated for Atlantic salmon;
- River Dee (Afon Dyfrdwy) SSSI (located approximately 0.1 km upstream of the Water Connection Corridor) designated for Atlantic salmon and brown trout;
- North Anglesey Marine / Gogledd Môn Forol SAC/ Marine Protected Area (MPA) (located 80 km from the Water Connection Corridor) designated for Annex II Harbour porpoise; and
- [Llyn Llŷn](#) Peninsula and the Sarnau (Pen Llŷn â'r Sarnau) SAC designated for a number of marine habitats but is also designated for bottlenose dolphin and grey seal (located 160 km from the Water Connection Corridor).

6.2.10 Habitats presented in the Dee Estuary where the footprint of the Water Connection Corridor is located consists of fine muddy sand, which supports a number of benthic invertebrates. One Marine Invasive Non-Native Species is present; the Chinese mitten crab. There are a number of coastal fish species and migratory fish species. The River Dee is of particular interest for Atlantic salmon. Marine mammals are also present including; Harbour porpoise, bottlenose dolphin, common dolphin, Risso's dolphin, minke whale, harbour and grey seal.

6.2.11 Full details of marine receptors are presented in **Chapter 12: Marine Ecology (EN010166/APP/6.2.12)** of ES Volume II.

Transport Receptors

6.2.12 The principal access to the Main Development Area during the construction and operation of the Proposed Development would be via Kelsterton Road which provides a link to the A548 Chester Road with wider connections to the Strategic Road Network including M56 and M53 to the north-east of the Order limits. These roads provide connections to the Accommodation Work Areas.

6.2.13 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 Construction and Operation Area (entering the Alternative Access to the Construction and Operation Area and Access to C&IEA), via a priority T-Junction with an unnamed access road, located opposite Coleg Cambria.

6.2.14 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 Construction and Operation Area and the A55 to the south. Allt-Goch Lane / Coed Onn Road is a single carriageway road that lies approximately 2.5 km to the west of the Construction and Operation Area. The Proposed CO₂ 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.

- 6.2.15 Golftyn Lane connects to the B5129 via a priority T-Junction, located opposite the entrance of the Alternative Access to the Construction and Operation Area and Access to the C&IEA.
- 6.2.16 Mold Road performs a similar distributor function to Golftyn Lane and is accessed from the B5129, approximately 2.5 km south-east of the Construction and Operation Area. 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.
- 6.2.17 The A5119 is accessed in Flint, approximately 4.5 km to the north-west of the Construction and Operation Area. 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 Construction and Operation Area, as well as to the east and beyond into North-West England.
- 6.2.18 There are varying levels of provision for walking and cycling on Kelsterton Road between the A548 and the access to the Main Development Area. 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.
- 6.2.19 The B5129 provides emergency access to the south-east of the Order limits (entering the Alternative Access to Main Development Area and Access to C&IEA), via a priority T-Junction with an unnamed access road, located north of Deeside Stadium.
- 6.2.20 Public Rights of Way (PRoW) in the vicinity of the Main Development Area and the Proposed CO₂ Connection Corridor include:
- a designated footpath (FCC Footpath 28) that lies within 5 m to the south-eastern extent of the C&IEA and connects to the B5129, continuing towards Quay Business Park where it terminates; and
 - a designated footpath (FCC Footpath 66) also intersects the field parcel containing the Proposed CO₂ Connection Corridor, forming a link between Allt-Goch Lane and the farm access road forming the northern boundary of the field parcel.
- 6.2.21 National Cycle Network (NCN) Route 5 is located in close proximity to the Main Development Area, routing along the A548 to the west of the Main Development Area, before connecting to Kelsterton Road and, subsequently, the B5129.

Geological, Hydrogeological and Hydrological Receptors

- 6.2.22 The Order limits are underlain by superficial Tidal Flat Deposits that are designated as a Secondary Undifferentiated Aquifer and by Glaciofluvial Deposits classified as a Secondary A aquifer, with bedrock of the Pennine Lower Coal Measures Formation - mudstone, siltstone and sandstone designated as a Secondary A aquifer. The Order limits do not contain or lie within or in close proximity (<1 km) to any groundwater Source Protection Zones.
- 6.2.23 The River Dee is a designated Main River and flows south-east to north-west within/ and north of the Order limits. The river is defined as part of the Dee Estuary at this location. Kelsterton Brook, Old Rockcliffe Brooke / Drain and Lead Brook / Northop Brook, all ordinary watercourses, intersect with or are in proximity to the Order limits. Surface watercourses are shown on **Plate NTS 13**.

Terrestrial Heritage Receptors

- 6.2.24 There are ten scheduled monuments, 77 listed buildings, and four conservation areas located within 3 km of the Construction and Operation Area. These are shown on **Plate NTS 14** and **Plate NTS 15**.
- 6.2.25 The nearest scheduled monuments to the Construction and Operation Area include the Croes Atti Roman Site located 140 m west and Pentre Bridge Roman Site located 600 m west
- 6.2.26 The 77 listed buildings within the 3 km study area include one Grade I listed building, a church dating to the medieval period, and six Grade II* listed buildings comprising a hall, houses, farmhouses, and a school building dating to the post-medieval and modern periods. The remaining 70 Grade II listed buildings comprise farmsteads and associated farm buildings, war memorials, ancillary buildings, schools and churches dating to the post-medieval and modern periods.
- 6.2.27 The nearest listed buildings to the Construction and Operation Area include:
- Kelsterton Hall (Cadw: 1; Grade II), located approximately 120 m south-west of the Main Development Area;
 - Leadbrook Hall (Cadw: 16409; Grade II), located approximately 180 m south of the Repurposed CO₂ Connection Corridor; and
 - Church of St Mark (Cadw: 85254; Grade II), located approximately 320 m south-east of the C&IEA.
- 6.2.28 There are also three registered historic parks and gardens within 3 km of the Construction and Operation Area. The closest of which is Shotton Steelworks Garden, Grade II registered park and garden, which is located approximately 2.2 km south-east of the C&IEA.

Plate NTS 13: Watercourses

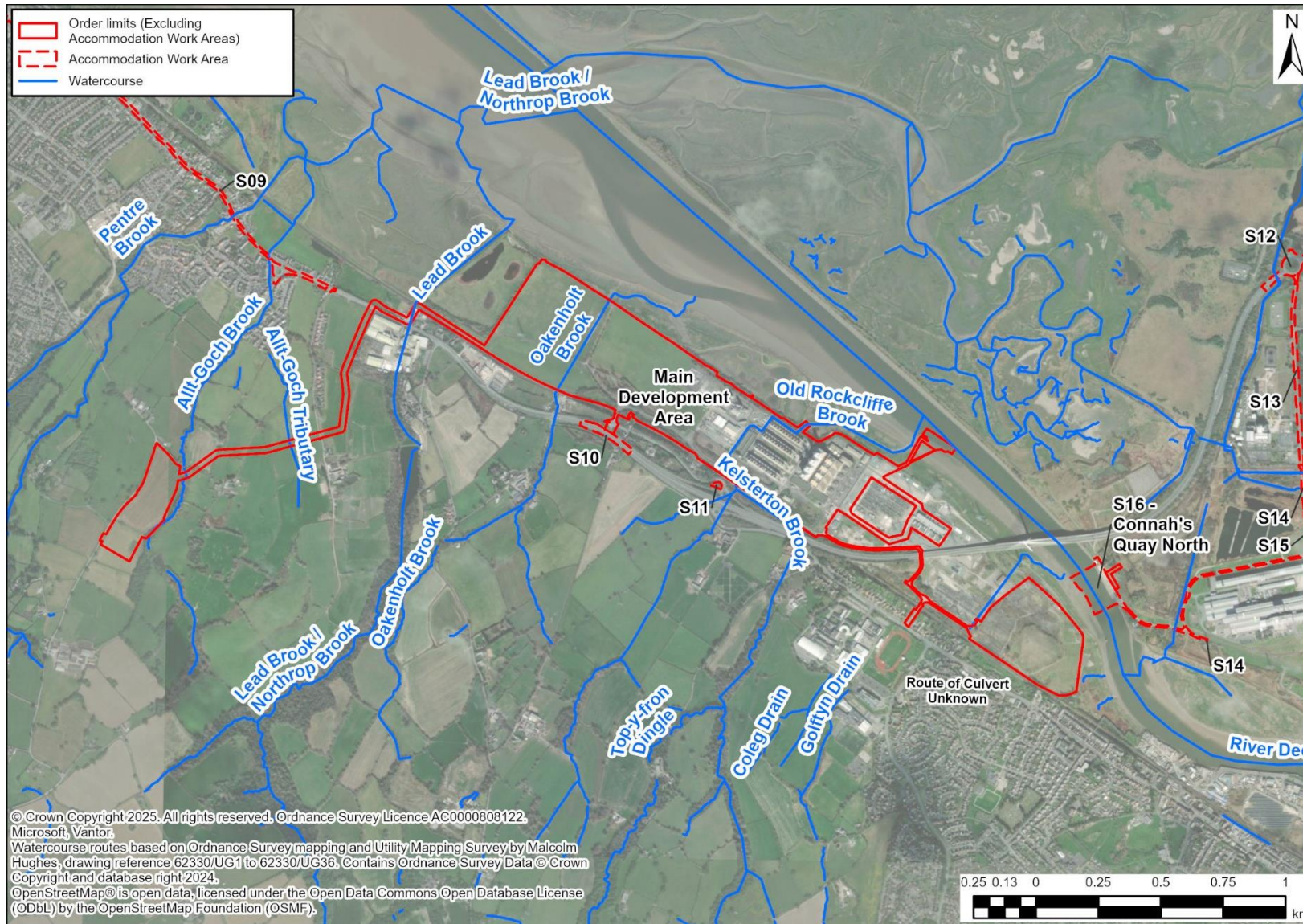


Plate NTS 14: Designated Heritage Assets

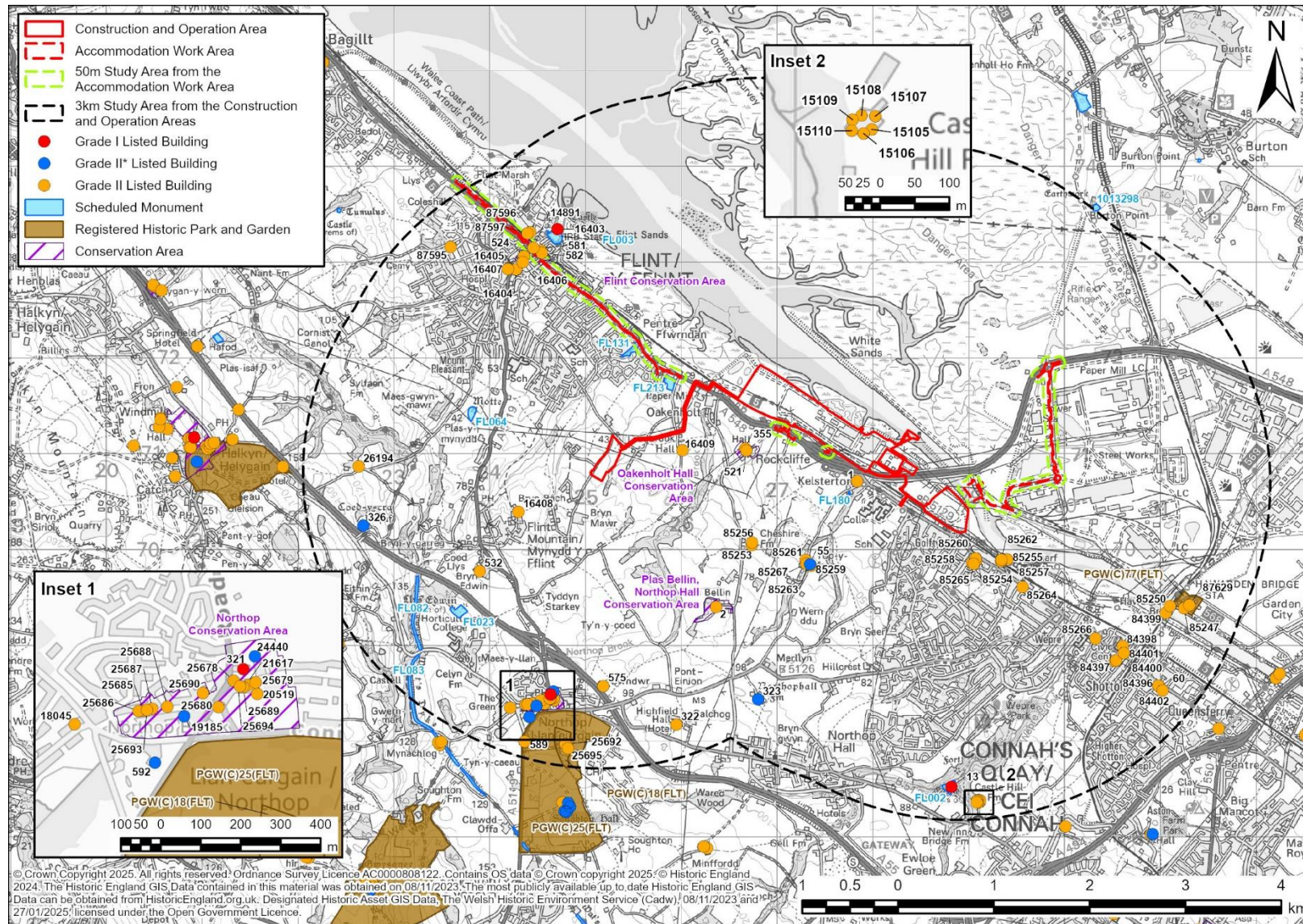
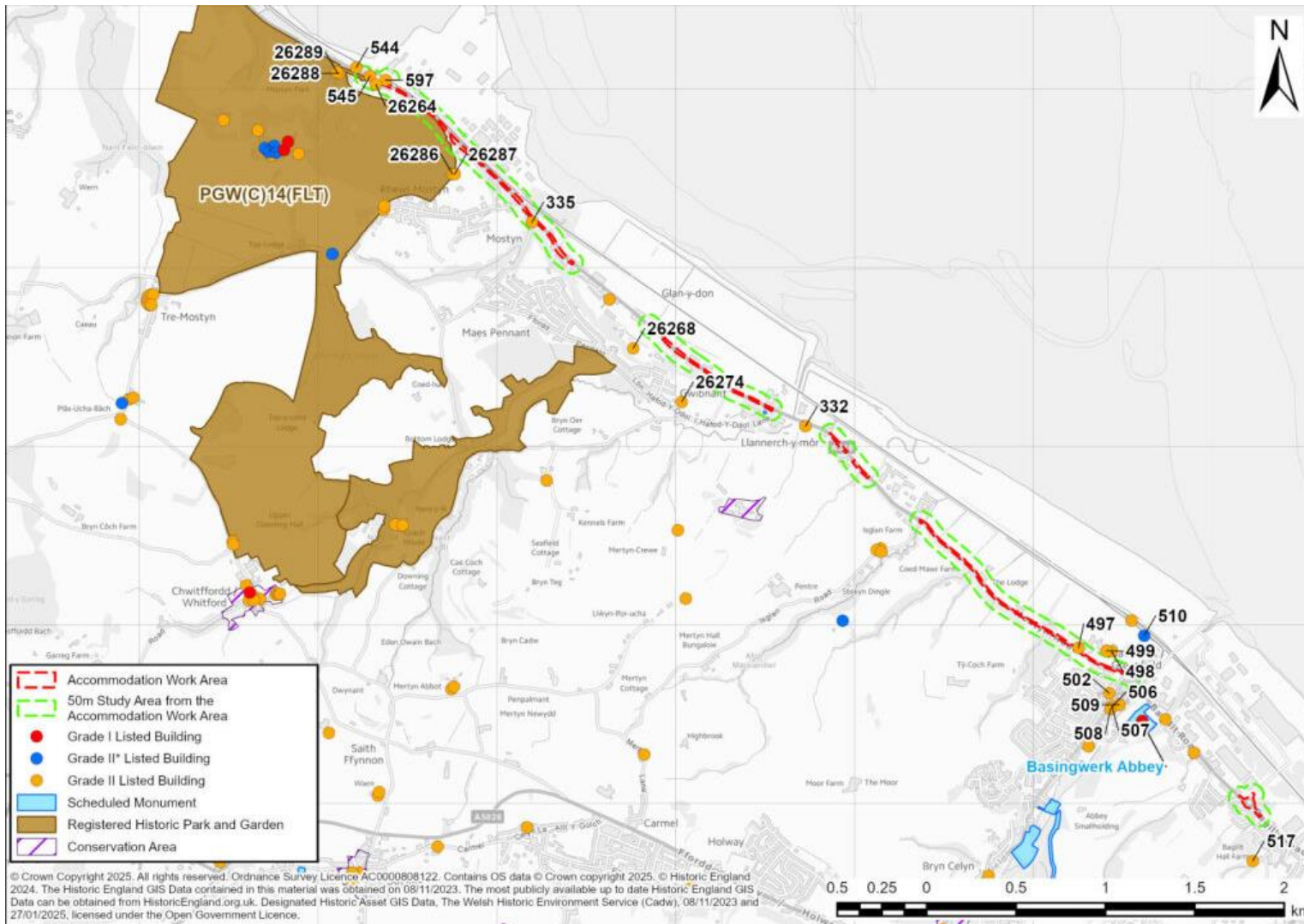


Plate NTS 15: Designated Heritage Assets (focused at the Accommodation Works Area at the Port of Mostyn)



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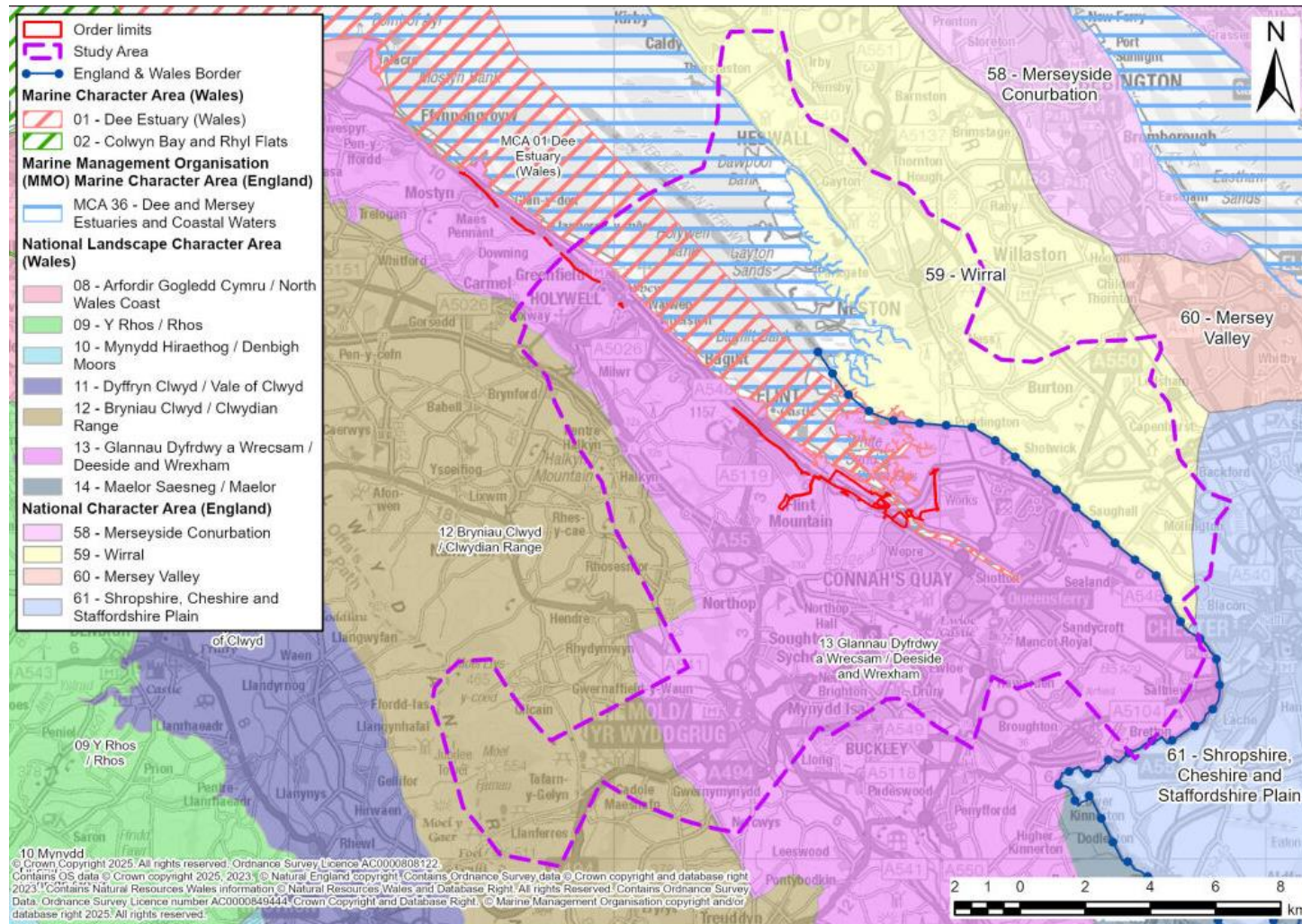
Marine Heritage Receptors

- 6.2.29 Within the footprint of the Water Connection Corridor and the Surface Water Outfall Area there are no designated marine sites, no known shipwreck sites, no known aviation sites, no prehistoric sites, and no recorded marine and aviation losses. There are no known shipwreck sites or aircraft remains in the Water Connection Corridor.

Landscape and Visual Receptors

- 6.2.30 The Main Development Area is situated approximately 5 km east from the NLCA 12 – Bryniau Clwyd/ Clwydian Range which includes the Clwydian Range and Dee Valley National Landscape. The most extensive upland areas in the Clwydian Range are centered on Moel Famau. These are areas of smooth, open, rounded, and distinctively shaped heather-clad hills.
- 6.2.31 The Construction and Operation Area is located within National Landscape Character Area 13: Glannau Dyfrdwy a Wrecsam /Deeside and Wrexham (NLCA13), defined by Natural Resources Wales (NRW). These are shown on **Plate NTS 16**.
- 6.2.32 The Main Development Area is situated along the southern shore of the Dee Estuary and is located within Marine Character Area 01: Dee Estuary (MCA01). 'Character areas' are defined by the relevant authority based on their distinct, recognisable character and natural boundaries.
- 6.2.33 The open countryside to the north of the Main Development Area, which overlooks the Dee Estuary, has been designated as an Area of Special County Value by Cheshire West and Chester Council, for its distinctiveness, landscape character, and scenic views over the Estuary.
- 6.2.34 The Main Development Area lies adjacent to the Dee Estuary and includes the existing Connah's Quay Power Station. There is a strong industrial character along the Dee Estuary at Connah's Quay and Holywell that includes large scale power generation and industrial plants.
- 6.2.35 The Main Development Area includes operational parts of the existing Connah's Quay Power Station to the south-east and three fields currently used for agricultural uses to the north-west.
- 6.2.36 The Main Development Area is bordered to the north, north-east and north-west by the Dee Estuary, to the east and south-east by the existing National Grid Electricity Transmission (NGET) 400 kV substation, and to the south and south-west by the North Wales Main Line Railway.
- 6.2.37 Visibility within the study area is limited by built form, topography, and intervening vegetation. There are frequent, open views towards the Main Development Area from higher ground from the south-west and sloping ground towards the Dee estuary. Due to the low-lying land bordering the Dee Estuary, open panoramic views are available across the estuary, along coastal roads, and slightly elevated open spaces where there is an absence of built form and vegetation.

Plate NTS 16: National Character Areas



7. EIA Methodology

7.1 EIA Process

- 7.1.1 The EIA process seeks to identify and assess likely significant environmental effects. It seeks to outline and implement measures to avoid, reduce or offset adverse effects and improve beneficial effects. The EIA process aims to provide stakeholders and decision makers with necessary information to understand the likely significant environmental effects of a future development to inform decision making.
- 7.1.2 The objective of the EIA process is to anticipate the changes (or 'impacts') that may occur to the environment as a result of a proposed development. The changes are compared to the existing environmental conditions (the baseline conditions) and those that would have occurred without the proposed development (the future baseline conditions).
- 7.1.3 The EIA process identifies potentially sensitive 'receptors' that may be affected by these changes (e.g. people living near the development or local flora and fauna) and defines the extent to which these receptors may be affected by the predicted changes. These effects are then assessed as to whether they are 'significant'.
- 7.1.4 The environmental impacts and effects of the Proposed Development are assessed at key stages in its construction and operation (including maintenance), and where possible and relevant, its eventual decommissioning.
- 7.1.5 Where the EIA predicts a likely significant adverse effect, mitigation measures are identified where possible to avoid, reduce or offset the effect, and/or to reduce the likelihood of it happening and/or the magnitude of the effect. Measures are split into:
- development design and embedded mitigation – these are measures that have been integrated into the Proposed Development. Such measures may include refinement of the design and layout and adherence to relevant legislation, guidance and industry standard practice.
 - additional mitigation and enhancement measures – these are additional measures that may reduce any significant adverse effects and enhance beneficial effects. Such measures may include, for example, the use of additional acoustic fencing to help limit impacts which generate noise.
- 7.1.6 The ES has been submitted alongside the application for the DCO and has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- 7.1.7 Details of the EIA Methodology are provided within **Chapter 2: Assessment Methodology (EN010166/APP/6.2.2)** of ES Volume II.

7.2 EIA Scoping

- 7.2.1 EIA Scoping is a process that is designed to identify relevant topics that should be included in the EIA and reported in the ES.
- 7.2.2 An EIA Scoping Report and a request for an EIA Scoping Opinion was submitted to PINS and relevant consultees on 8 February 2024. The exercise has provided an opportunity for PINS and consultees to comment on the content and approach to the environmental assessments proposed to be undertaken. A copy of the Scoping Report is provided within **Appendix 1-A: Scoping Report (EN010166/APP/6.4)** of ES Volume IV.
- 7.2.3 An EIA Scoping Opinion was received from PINS on 20 March 2024 and is presented within **Appendix 1-B: Scoping Opinion (EN010166/APP/6.4)** of ES Volume IV. The feedback provided was then analysed and taken on board as part of the development of the ES, this is presented in **Appendix 2-B: Scoping Opinion Responses (EN010166/APP/6.4)**.

7.3 Environmental Statement

- 7.3.1 A Preliminary Environmental Information Report (PEIR) was produced to inform Statutory Consultation with the public and other stakeholders about the Proposed Development.
- 7.3.2 Following the Statutory Consultation period, this ES was prepared to accompany the DCO application and includes the EIA of the Proposed Development, taking account of any design evolution that has taken place, as well as feedback received during consultation and technical engagement.
- 7.3.3 **ES Volume I: Non-Technical Summary (EN010166/APP/6.1)** is this document.
- 7.3.4 **ES Volume II: Chapters (EN010166/APP/6.2)** is the main volume of the ES for the Proposed Development includes the following chapters:
- **Chapter 1:** Introduction;
 - **Chapter 2:** Assessment Methodology;
 - **Chapter 3:** Location of the Proposed Development;
 - **Chapter 4:** The Proposed Development;
 - **Chapter 5:** Construction Management and Programme;
 - **Chapter 6:** Project Alternatives;
 - **Chapter 7:** Planning Policy and Need;
 - **Chapter 8:** Air Quality;
 - **Chapter 9:** Noise and Vibration;
 - **Chapter 10:** Traffic and Transport;
 - **Chapter 11:** Terrestrial and Aquatic Ecology;
 - **Chapter 12:** Marine Ecology;
 - **Chapter 13:** Water Environment and Flood Risk;

- **Chapter 14:** Geology and Ground Conditions;
- **Chapter 15:** Landscape and Visual Amenity;
- **Chapter 16:** Physical Processes;
- **Chapter 17:** Terrestrial Heritage;
- **Chapter 18:** Marine Heritage;
- **Chapter 19:** Socio-Economics, Recreation and Tourism;
- **Chapter 20:** Climate Change;
- **Chapter 21:** Human Health;
- **Chapter 22:** Major Accidents and Disasters;
- **Chapter 23:** Materials and Waste;
- **Chapter 24:** Cumulative and Combined Effects; and
- **Chapter 25:** Summary of Likely Significant Environmental Effects.

7.3.5 **ES Volume III: Figures (EN010166/APP/6.3)** is also included, where figures are provided to accompany each chapter of the ES.

7.3.6 **ES Volume IV: Technical Appendices (EN010166/APP/6.4)** provides supporting information for each of the chapters of the ES.

7.3.7 The DCO application is accompanied by a number of control documents that this ES references. They are summarised below:

- **Framework Construction Environmental Management Plan (CEMP) (EN010166/APP/6.5)** includes detailed descriptions of the actions required to be implemented by the main contractor(s) and the Applicant during the construction phase of the Proposed Development. It also includes a mitigation register setting out all of the mitigation measures proposed as part of the ES;
- **Outline LEMP (EN010166/APP/6.9)** sets out measures to make sure that habitats created/ enhanced for biodiversity are maintained during the operational phase of the Proposed Development;
- **Framework Construction Traffic Management Plan (CTMP) (EN010166/ APP/6.6)** which aims to reduce any significant effect of increased traffic flow during construction such as potential community severance effects on users of community facilities and other social infrastructure nearby to the Proposed Development;
- **Framework Construction Worker Travel Plan (CWTP) (EN010166/APP/6.7)** which sets out how construction workers will travel to and from construction sites, supporting and encourages sustainable travel by workers (public transport, cycling, walking and car-sharing);
- **Lighting Strategy (EN010166/APP/7.22)**; as some external lighting would be required during the operational phase to ensure the CCGT and CCP and associated infrastructure can operate safely at all times. The **Lighting Strategy (EN010166/APP/7.22)** describes the reasonable worst-case scenario and has been put in place to reduce the visual impact of lighting on the local environment;

- **Curlew Mitigation Strategy (EN010166/APP/6.13)** provides details of the offsetting measures for Curlew associated with the Dee Estuary / Aber Dyfrdwy SPA / Ramsar site;
- **Off-site Net Benefit for Biodiversity and Green Infrastructure Strategy (EN010166/APP/6.14)** provides details of measures to ensure the Proposed Development results in a net benefit for biodiversity;
- **Operation and Maintenance Mitigation Register (ES Appendix 4-A, EN010166/APP/6.4)** outlines all of the currently identified environmental commitments and mitigation measures relevant to the operation (including maintenance) of the Proposed Development;
- **Design Principles Document (EN010166/APP/7.8)** sets out the key design principles that will guide the detailed design of the Proposed Development, ensuring environmental mitigation and good design objectives are carried through into the final design;
- **Outline Surface Water Drainage Strategy (EN010166/APP/6.4)** sets out the proposed approach to managing surface water runoff, including drainage principles and measures to control flood risk and protect water quality;
- **Greenhouse Gas Reduction Strategy (EN010166/APP/6.4)** sets out the measures incorporated into the Proposed Development to reduce greenhouse gas emissions during construction and operation;
- **Navigational Risk Assessment (EN010166/APP/6.15)** assesses the potential effects of the Proposed Development on marine navigation and identifies any measures required to maintain navigational safety;
- **Overarching Written Scheme of Investigation for Terrestrial and Marine Heritage Mitigation Written Scheme of Investigation (EN010166/APP/6.8)** sets out the framework for archaeological investigation and recording to be undertaken prior to and during construction; and
- **Saltmarsh Creation Strategy (EN010166/APP/9.17)** sets out the proposed saltmarsh creation works and the approach to their implementation and monitoring.

8. Results of the EIA

8.1 Air Quality

8.1.1 **Chapter 8: Air Quality (EN010166/APP/6.2.8)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to air quality.

Baseline Environment and Study Area

8.1.2 The study area was defined to include air quality features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development, termed the Zone of Influence (Zoi). The potential Zoi is considered to be:

- 15 km from the Main Development Area as a study area for statutory designated sites i.e. SPAs, SACs, Ramsar sites and SSSIs, with 2km for non-statutory designated nature conservation sites;
- 2 km from the emissions stacks for human health impacts (sensitive receptors for the human health impacts have been selected to represent impacts both within this 2 km zone and further afield where appropriate);
- construction and decommissioning dust assessments considered potential impacts on human health and amenity within 250 m of the site and 50 m from access roads (up to 250 m from site entrances), and on ecological sites within 50 m of the site and access roads (also up to 250 m from entrances); and
- 200 m from the road centreline of all road links in the affected road network for potential impacts due to changes in pollutant concentrations associated with changes in road traffic flows.

8.1.3 Residential and ecological receptors within the potential Zoi are described in Section 6.2.

Air Quality Management Areas

8.1.4 There are no Air Quality Management Areas (AQMAs) designated within the administrative boundary of FCC, or in the neighbouring areas of Denbighshire, Wrexham and Wirral and therefore none within the Order limits. The nearest AQMAs are located within Cheshire West and Chester Council (CWCC); one in Chester approximately 12 km east from the Main Development Area and two in Ellesmere Port, approximately 13 km north-east and 15 km east from the Main Development Area.

8.1.5 The existing air quality in the vicinity of the Proposal Development has been evaluated by review of Local Authority air quality management report and other published data, as well as a site-specific survey and modelling of existing traffic and stack emissions. The key pollutants of concern in this air quality assessment include NO_x, NO₂, CO, NH₃, PM₁₀ and PM_{2.5}.

Overview of Assessment

8.1.6 Air Quality effects during construction may include:

- impacts on amenity, human health and ecological receptors from fugitive emissions of dust and particulate matter; and
 - impacts on human health and ecological receptors from traffic emissions.
- 8.1.7 The effects on air quality during the operation of the Proposed Development may include operational emission effects on human health and ecology.
- 8.1.8 The predicted air quality impacts of decommissioning of the Proposed Development are considered to be comparable to, or less than, those associated with construction activities.

Mitigation

- 8.1.9 The Proposed Development has been designed, as far as possible, to avoid or minimise effects on air quality. Embedded mitigation measures have been incorporated into the design, such as designing the heights of the stacks to ensure emissions are dispersed effectively, implementing emissions control and compliance with Emission Limit Value. Standard construction practices would also be followed through the implementation of the measures within the **Framework CEMP (EN010166/APP/6.5)**, such as the development and implementation of a dust management plan, and planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- 8.1.10 No additional mitigation or enhancement related to air quality is required.

Residual Effects and Conclusion

Construction and Decommissioning Effects

- 8.1.11 The effects on all identified receptors during the construction phase is expected to be not significant. As the impacts during decommissioning are considered comparable to, or less than, those associated with construction activities, air quality effects on all identified receptors during the decommissioning phase are also considered to be **not significant**.

Operation Effects

- 8.1.12 The effects on all identified human health receptors during the operation phase is expected to be not significant. Further discussion on ecological receptors is provided in Sections 8.4 and 8.5.

8.2 Noise and Vibration

- 8.2.1 **Chapter 9: Noise and Vibration (EN010166/APP/6.2.9)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to noise and vibration.

Baseline Environment and Study Area

- 8.2.2 The study area was defined to include the spatial extent of identified noise and vibration sensitive receptors with the potential to be significantly affected by direct or indirect impacts that might arise from the Proposed Development. The potential Zol is considered to be:
- construction noise:

- 300 m from the Construction and Operation Area;
 - 1 km from the Main Development Area;
 - a further 300 m from the Proposed CO₂ Connection Corridor and C&IEA that extend beyond the 1 km study area of the Main Development Area;
 - construction vibration:
 - Noise Sensitive Receptors (NSRs) within 100 m from the closest construction activity with the potential to generate vibration;
 - construction traffic:
 - based on the spatial extent of traffic links in the transport model; and
 - operational noise:
 - NSRs within 1 km of the Main Development Area.
- 8.2.3 From a review of aerial imagery and observations during site surveys, the dominant sources of sound in the area are the infrastructure at the existing Connah's Quay Power Station, rail traffic and traffic on the local road network including the A548, B5129 and Chester Road.
- 8.2.4 Noise Sensitive Receptors are described in Section 6.2.

Overview of Assessment

- 8.2.5 Noise and Vibration effects during construction and operation may include:
- noise and vibration impacts during construction works and within the Construction and Operation Area for NSRs during the day;
 - noise and vibration impacts during construction works within the Construction and Operation Area for NSRs at night; and
 - change in construction road traffic noise level.
- 8.2.6 Potential effects identified for the operational phase include noise impacts during operation of the Proposed Development for NSRs.

Mitigation

- 8.2.7 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on noise and vibration through the process of design development, and by embedding measures into the Proposed Development design. These measures include the implementation of the **Framework CEMP (EN010166/APP/6.5)**, **Framework CWTP (EN010166/APP/6.7)** and **Framework CTMP (EN010166/APP/6.6)**, compliance with Environmental Permits and the implementation and maintenance of an Environmental Management System (EMS) which would be certified to ISO 14001.
- 8.2.8 Construction activities would typically be undertaken during Proposed Development core construction working hours 08:00 to 18:00 Monday to Friday (except bank holidays) and 08:00 to 13:00 on Saturdays. The Applicant will agree with FCC any necessary protocols to ensure that impacts are kept to a minimum, if any works are required to be undertaken outside of core construction hours.

- 8.2.9 Where significant construction effects are initially predicted, additional noise-control equipment such as jackets on pneumatic drills, acoustic covers on compressors, shrouds on piling rigs and cranes and potentially further refinement of construction works programme would be considered and implemented where practicable. The use of temporary barriers or screens may also provide additional mitigation.
- 8.2.10 Where vibratory rollers are to be used within 50 m of receptors these would be required to be used on low amplitude mode and no vibratory rollers to be used with 16 m of NSRs.
- 8.2.11 To prevent significant adverse effects during operation, mitigation measures to minimise operational sound will be considered during detailed design to ensure compliance with the operational noise limit agreed with FCC. Provision of a package of sound insulation to nearby NSRs may also be considered, as a last resort, where other measures are unlikely to be adequate.

Residual Effects and Conclusion

Construction and Decommissioning Effects

- 8.2.12 A moderate adverse effect, which is **significant**, remains on two residential receptors (R21 and R22¹) due to road traffic noise on Kelsterton Road (access road to the Main Development Area) even after the implementation of additional mitigation measures.
- 8.2.13 The potential effects during the decommissioning phase are considered to be comparable or less than the effects listed above for construction.

Operation Effects

- 8.2.14 After the incorporation of embedded and additional mitigation, there are **no significant** residual effects on noise and vibration reported in the ES.

8.3 Traffic and Transport

- 8.3.1 **Chapter 10: Traffic and Transport (EN010166/APP/6.2.10)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to traffic and transport.

Baseline Environment and Study Area

- 8.3.2 The study area has been defined to include Traffic and Transport features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development. The study area is considered to comprise of the main highway links and the public transport, cycle and walking provision within the immediate vicinity of these links. These relate to the Construction and Operation Area and its surroundings.
- 8.3.3 A 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. Automatic Traffic Count surveys were undertaken to collect traffic data for the local highway network.

¹ this effect is also considered to apply to the traveller's encampment.

The majority of these surveys were undertaken in March 2024 with a further survey period taking place in April 2024. Further information in relation to this is provided in the **Transport Assessment (Appendix 10-A (EN010166/APP/6.4))**.

8.3.4 Transport receptors are described in Section 6.2.

Overview of Assessment

8.3.5 Traffic and Transport effects during construction and decommissioning may include:

- impacts on the road network from a temporary increase in traffic; increase in the distribution of traffic (both Heavy Good Vehicles (HGV) and Light Good Vehicles (LGV));
- impacts on PRow;
- impacts relating to AILs and the Accommodation Works Area; and
- the in-combination / cumulative effects arising as a result of other committed developments within the vicinity of the Proposed Development severance – relating to the change in traffic flows effecting road links and PRow.

8.3.6 Due to the nature of the Proposed Development, there would be minimal impacts attributed to the operational traffic once the Proposed Development is built. This Traffic and Transport assessment includes an assessment of operational traffic impact, albeit there are no significant effects identified.

Mitigation

8.3.7 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on Traffic and Transport through the process of design development, and by embedding measures into the design of the Proposed Development through the **Framework CTMP (EN010166/APP/6.6)** and the **Framework CWTP (EN010166/APP/6.7)**.

8.3.8 The **Framework CTMP (EN010166/APP/6.6)** sets out measures to control construction HGV traffic, including the following:

- detailed construction routes for all HGVs;
- restrictions on HGVs during certain times of the day such as at school drop off and pick up times;
- application of the waste hierarchy which seeks to reduce the quantity of materials required to be transported off-site onto the local highway network through prioritising reuse and recycling;
- measures to reduce impacts on the local community during construction, including communications such as letter and notices to residents and businesses that lie in close proximity to the Construction and Operation Area and surrounding construction routes; and
- procedures for AILs and Hazardous Loads.

8.3.9 The **Framework CWTP (EN010166/APP/6.7)** is aimed at construction workers and sets out measures to reduce the impact of workers on the local highway network, including the following:

- targets for achieving a minimum level of car sharing amongst workers;
- minibuses which would pick up workers from key local accommodation centres;
- measures to manage the level of car parking on site; and
- measures to encourage workers to travel by more sustainable mode of travel, wherever possible.

8.3.10 A DEMP would be produced at the time of decommissioning.

8.3.11 No additional mitigation or enhancement related to Traffic and Transport is required.

Residual Effects and Conclusion

Construction, Operation and Decommissioning Effects

8.3.12 The traffic and transport assessment demonstrates the largest impact would be experienced on Kelsterton Road during construction with regard to the distribution of traffic, fear and intimidation, severance and pedestrian amenity. However, taking into account the embedded mitigation measures outlined in the **Framework CTMP (EN010166/APP/6.6)** and the **Framework CWTP (EN010166/APP/6.7)**, the effects are considered to be **not significant**.

8.3.13 The effects on all other identified receptors during the construction and operation phases are also expected to be **not significant**.

8.3.14 The effects during the decommissioning phase are expected to be similar or less than the during the construction phase and are therefore considered to be **not significant**.

8.4 Terrestrial and Aquatic Ecology

8.4.1 **Chapter 11: Terrestrial and Aquatic Ecology (EN010166/APP/6.2.11)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to terrestrial and aquatic ecology including the nature conservation designations and protected and notable habitats and species.

Baseline Environment and Study Area

8.4.2 The study area has been defined to include the likely Zol where there is potential for significant effects on relevant ecological features to occur. This is 15 km for all statutory designated sites for nature conservation at a European and National level, such as Special Protection Areas and Sites of Special Scientific Interest, and 2 km for locally designated sites, such as Local Wildlife Sites. These ecological receptors are described in Section 6.2.

- 8.4.3 Protected and notable habitats located in the study area (but outside of the nature conservation designations) include a variety of woodlands, ancient woodlands, grasslands, scrubs and crops.
- 8.4.4 A large number of ecological field surveys were conducted to define the baseline for the Proposed Development. The following protected species or species groups were identified to be of local importance and above and were therefore taken forward to impact assessment:
- SPA/Ramsar site qualifying species, such as curlew,
 - great crested newt;
 - reptiles;
 - bats (roosting, and foraging/commuting);
 - badgers;
 - otters;
 - terrestrial invertebrates;
 - hedgehog/amphibians;
 - aquatic invertebrates;
 - fish; and
 - aquatic macrophytes.

Overview of Assessment

- 8.4.5 During construction, operation and/or decommissioning of the Proposed Development, potential impacts on the ecological receptors identified above could include:
- habitat loss, fragmentation or damage;
 - changes in air quality;
 - noise and vibration disturbance;
 - visual disturbance from artificial lighting;
 - alteration of local hydrology and water quality; and
 - incidental mortality.

Mitigation

- 8.4.6 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on ecology. A number of mitigation measures have been embedded into the design of the Proposed Development for both the construction and operation phase. Examples include precautionary methods of vegetation clearance, the inclusion of a minimum of 30 m ecological safeguard zones for all construction laydown areas, for the protection of sensitive habitats/species occupying the Dee Estuary. Additional sediment control measures will be in place around the Kelsterton Brook/Old Rockcliffe Drain culvert, so construction works do not result in untreated water entering the culvert as a pathway to the River Dee. During the operation phase, the Proposed Development has been designed

to provide Net Benefit for Biodiversity above the existing baseline situation. See the **Green Infrastructure Statement (EN010166/APP/6.11)** for further details.

- 8.4.7 To prevent significant adverse effects during construction, a number of additional mitigation measures are also considered, such as additional planting, seasonal restrictions on specific construction activities, additional measures to reduce noise, translocation of reptiles. During the operational phase, habitats would be managed and monitored.

Residual Effects and Conclusion

Construction

- 8.4.8 There would be a **short term significant adverse effect** on open mosaic habitat and terrestrial invertebrates due to habitat loss, which would reduce to **no significant effects** in the medium to long term (2 years post construction).

Operation Effects

- 8.4.9 During operation, with the implementation of mitigation measures there would be **no significant residual effects** on ecological receptors.

8.5 Marine Ecology

- 8.5.1 **Chapter 12: Marine Ecology (EN010166/APP/6.2.12)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to Marine Ecology.

Baseline Environment and Study Area

- 8.5.2 The following study areas have been identified for each Marine Ecology receptor:
- designated sites: 10 km (sites excluding sites designated for marine mammals) and 160 km for sites designated for marine mammals;
 - benthic ecology: Tidally influenced limits of the River Dee and Dee Estuary within 10 km;
 - coastal and migratory fish: Tidally influenced limits of the River Dee and Dee Estuary within 10 km, a regional approach for migratory fish and relevant International Council for the Exploration of the Sea (ICES) statistical rectangles; and
 - marine mammals: Celtic Sea with a particular focus on the Dee Estuary.
- 8.5.3 There are five nature conservation designations with relevant marine receptors within the study area including:
- The Dee Estuary (Aber Dyfrdwy) SAC / Ramsar / SSSI;
 - River Dee and Bala Lake SAC;
 - River Dee (Afon Dyfrdwy) SSSI; and
 - North Anglesey Marine / Gogledd Môn Forol SAC/ MPA.

- 8.5.4 The estuarine habitats present within the Study Area were identified from online data from intertidal surveys and include:
- A2.2 Intertidal Sand and Muddy Sand;
 - A2.3 Intertidal Mud;
 - A2.5 Coastal Saltmarshes and Saline Reedbeds; and
 - A2.4 Intertidal Mixed Sediments.
- 8.5.5 An intertidal walkover and drone survey was completed with identified European Nature Information System (EUNIS) habitats within a specific Survey Area, which comprises of the Water Connection Corridor and extends approximately 300 m either side of the Water Connection Corridor along the River Dee. The habitats identified in this Survey Area included the four habitats listed above as well as an additional Intertidal Rock type (A1).
- 8.5.6 A number of benthic invertebrate communities are present within and adjacent to the Water Connection corridor, including molluscs, nematodes, crustaceans and nemertean. The coastal and migratory fish present within the River Dee and Estuary included sea and river lamprey, european eel, twaite shad, smelt, and Atlantic salmon passed through periodically, adjacent to the Water Connection Corridor. Herring, sandeel and European bass is within the Dee Estuary. A number of marine mammals are also present in the Irish Sea (harbour porpoise, bottlenose dolphin, common dolphin, Risso's Dolphin and minke whale) and the River Dee/West Hoyle sandbank (harbour seal and grey seal).

Overview of Assessment

- 8.5.7 Marine Ecology effects during construction and decommissioning may include:
- indirect effects to marine ecology from changes in marine water quality (excluding turbidity) within the study area;
 - introduction and spread of invasive non-native species from any in-river works; and
 - collisions between project vessels and marine mammals, particularly seals.
- 8.5.8 Potential effects during operation may include:
- physical disturbance and potential mortality to benthic and fish and shellfish ecology from entrainment and impingement within the cooling water abstraction and discharge infrastructure within the Water Connection Corridor; and
 - 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).
- 8.5.9 Decommissioning activities are assumed to be limited to filling of the pipework, with the cooling water infrastructure remaining in-situ. There is therefore no pathway for any impact on the marine ecological receptors during the decommissioning phase.

Mitigation

- 8.5.10 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on Marine Ecology through the process of design development, and by embedding measures into the Proposed Development design, including:
- the implementation of the **Biosecurity Risk Assessment (Appendix 12-E: Marine Biosecurity Risk Assessment)** and the **Marine Invasive Non-Native Species Outline Management Plan (Appendix 12-F Marine Invasive Non-Native Species Outline Management Plan) EN010166/APP/6.4**);
 - the implementation of **Framework CEMP** including a **Framework Site Waste Management Plan (SWMP) (EN010166/APP/6.5)**;
 - the implementation of a Pollution Prevention Plan, including an emergency spill plan which would be implemented during all stages of the Proposed Development.
- 8.5.11 No additional mitigation or enhancement related to Marine Ecology is required.

Residual Effects and Conclusion

Construction and Decommissioning Effects

- 8.5.12 The effects on all identified receptors during the construction and decommissioning phases phase are expected to be **not significant**.

Operation Effects

- 8.5.13 The effects on all identified receptors during the operation phase are expected to be **not significant**.

8.6 Water Environment and Flood Risk

- 8.6.1 **Chapter 13: Water Environment and Flood Risk (EN010166/APP/6.2.13)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to water quality and resources, hydromorphology, flood risk and drainage of surface water and groundwater features including watercourses, lakes, canals, estuaries, coastal waters and aquifers.

Baseline Environment and Study Area

- 8.6.2 The study area represents a ZoI that has been defined to include water environment features that may be at risk from possible direct and indirect impacts that might arise from the Proposed Development, as well as to consider existing flood risk. The ZoI is 1 km from the Construction and Operation Area.
- 8.6.3 Hydrological receptors including surface water features are described in Section 6.2.
- 8.6.4 The Main Development Area, Electrical Connection Corridor, C&IEA, Water Connection Corridor and the Repurposed CO₂ Connection Corridor are all

entirely or partially situated on the south bank of the River Dee. These areas of the Site are potentially at risk from fluvial, tidal and, to a lesser extent, surface water flooding.

Overview of Assessment

8.6.5 Water Environment and Flood Risk Effects during construction may include:

- potential impacts on water quality due to uncontrolled discharge of sediment laden water;
- potential temporary impacts on water quality due to spillage of soils, fuels, or other construction chemicals, or through uncontrolled site run-off;
- short-term increases in suspended sediment and turbidity, with minor runoff from construction activities;
- excavation, open trenching, and back filling works could be impacted by uncontrolled runoff laden with fine sediment or accidental spillage;
- potential changes to hydromorphology (physical character and water content of waterbodies) associated with alterations to surface drainage patterns or crossings of upstream field ditches could lead to sediment mobilisation and input to channels;
- displaced floodwater through construction and the storage of materials within the floodplain resulting in increased flood risk to off-site receptors;
- increased surface water runoff resulting in increased flows to receiving environment;
- reduction of capacity of River Dee channel, resulting in increased flood risk to off-site receptors;
- changes to flow paths, potential temporary diversions of tributaries and increased hardstanding / compaction resulting in increased runoff;
- potential for contamination to enter the groundwater during construction due to accidental leakage and spills of fuels, oils, chemicals and concrete; and
- changes in groundwater flow and quantity.

8.6.6 Potential effects during operation may include:

- changes in water quality from operational discharges associated with the cooling water temperature and quality;
- potential for contaminated process water to be accidentally discharged or to overflow to the surface water discharge and be discharged to surface water receptors;
- potential for contaminants to be mobilised by surface water runoff and to discharge into Dee Estuary via the drainage pipeline and outfall;
- firewater containing pollutants contaminating surface water bodies;
- foul water contains pollutants being discharged into surface water bodies;

- loss of floodplain, resulting in increased flood levels impacting on off-site receptors;
- increases to surface water flow rates resulting in increased flood risk within watercourses, resulting in increased flood risk to off-site receptors;
- presence of new crossings altering hydromorphology through changes to bed and banks and diversions or new structures within the channels;
- changes in groundwater flow and quantity;
- changes to groundwater quality through introduction of new pathways along boundaries of subsurface infrastructure;
- contamination of groundwater as a result of chemical spills in the chemical storage area;
- potential for new pathways could be created along foundations of structures or along utilities which could result in contaminants migrating and entering groundwater; and
- land raising increasing the distance between the groundwater aquifers and the ground surface which can increase recharge time to aquifers.

8.6.7 Potential effects identified during the decommissioning phase are expected to be similar to the impacts reported for the construction phase, limited to water bodies in proximity to the Proposed Development.

Mitigation

8.6.8 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on water environment and flood risk through the process of design development, and by embedding measures into the design of the Proposed Development. Such measures include standard construction practices and measures to manage water and flood risk that will be followed in accordance with the **Framework CEMP (EN010166/APP/6.5)**. The operation of the Proposed Development, including cooling water discharge would be regulated by a permit(s) granted by Natural Resources Wales.

8.6.9 Mitigation measures relevant to the construction phase include the preparation of a Surface Water Monitoring Programme which would detail the requirement for daily observations and monitoring of upstream and downstream reaches of water features associated with the Proposed Development. It is also expected that water quality sampling would be undertaken on a periodic as well as ad-hoc basis, dependent upon circumstances / activities onsite.

8.6.10 Mitigation measures relevant to the operation phase includes the preparation of a Surface Water Management and Maintenance Plan (SWMMP) during the detailed design phase post consent to describe the requirements for access and frequency for maintaining drainage infrastructure proposed on the Site.

8.6.11 Mitigation measures relevant to the decommissioning would, as with the construction phase, be achieved principally through embedded measures identified, notably the adoption of a DEMP for the Proposed Development.

Accordingly, no additional mitigation is proposed in relation to decommissioning at this stage.

Residual Effects and Conclusion

Construction and Decommissioning effects

- 8.6.12 The effects on all identified receptors during the construction phase are expected to be **not significant**.
- 8.6.13 The effects during the decommissioning phase are expected to be similar or less than the during the construction phase and are therefore considered to be **not significant**.

Operation Effects

- 8.6.14 The effects on all identified receptors during the operation phase are also expected to be **not significant**.

8.7 Geology and Ground Conditions

- 8.7.1 **Chapter 14: Geology and Ground Conditions (EN010166/APP/6.2.14)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to geology and ground conditions. This also includes an agriculture and soils assessment which considers the effects of the Proposed Development on agricultural soil, in particular, the 'best and most versatile land'.

Baseline Environment and Study Area

- 8.7.2 The study area was defined to include geology and ground conditions features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development, termed the Zol. The potential Zol is as follows:
- impacts from the Proposed Development on soils, geological features, and Mineral Safeguard Areas (MSA): within the Order limits;
 - impacts to soil in relation to agricultural land: land directly impacted by the Proposed Development;
 - soils and geology baseline: a study area which extends 250 m from the Order limits;
 - determining the local baseline conditions with respect to land contamination: a 250 m study area from the Order limits with an extended study area for hydrogeology to 1 km from the Order limits; and
 - in-river assessment (associated with the Water Connection Corridor which partially extends into the Dee Estuary): geology within the Order limits.
- 8.7.3 A Mineral Safeguarding Area overlaps the south-eastern area of the Proposed CO₂ Connection Corridor that is likely to be sand and gravel.
- 8.7.4 Data on potential land contamination sources have been sourced from Groundsure, aerial mapping, site walkover records, previous reports and engagement with stakeholders. A number of potential sources are present

within the study area such as Made Ground and historical mine workings and mine shafts, current and former railways, former landfill sites and current and former agricultural land and farms.

- 8.7.5 A number of pathways have been identified through which any potential land contamination could impact on a receptor, such as direct contact / ingestion of contaminants within Made Ground, or leaching of soluble contaminants and migration of mobile contaminants into shallow groundwater. Sensitive receptors include on-site users such as construction / demolition workers, public users of PRowS, nature reserves, residents, aquifers, rivers and ecological sites as identified in Section 6.2.
- 8.7.6 The soils at the Main Development Area, the C&IEA, 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" on the Cranfield Soil and Agrifood Institute's (CSAI) Soilscales website. Section 6.2 describes the Agricultural Land Classification baseline.
- 8.7.7 An intrusive soil survey (sampling / testing the soil directly) was conducted at land in the Main Development Area to the north west of the existing Connah's Quay Power Station. This comprises of two agricultural fields currently used for livestock grazing. The soil survey identified one soil type across the entire survey site, which has been classified as ALC subgrade 3b. More information on this survey can be found in ES **Appendix 14-E: Agricultural Land Classification Survey (EN010166/APP/6.4)** in ES Volume IV.

Overview of Assessment

- 8.7.8 Geology and Ground Conditions effects during construction may include:
- mineral resources:
 - temporary adverse effects may occur where construction compounds are proposed within the MSA. This may result in a temporary sterilisation of the resource, preventing mineral extraction.
 - contaminated land:
 - mobilising existing contamination potentially present in soil and groundwater as a result of ground disturbance and potential dewatering, which is the removal of ground water;
 - increasing the potential for contaminants in unsaturated soils to leach to groundwater in open excavations during construction;
 - increasing the potential for contaminated surface run-off to migrate to surface water and groundwater receptors as a result of leaching from uncovered stockpiles of excavated materials;
 - introducing new sources of contamination, such as fuels and oils used in construction plant;
 - creating preferential pathways for the migration of soil contamination and gases, for example, along new below ground service routes, service ducts and as a result of potential dewatering;

- introducing new human health receptors such as site staff during and post-construction; and
- post construction, it is anticipated that if any remediation is carried out on potentially contaminated sites identified within the Order limits, there would, in most instances, be overall beneficial effects post-construction. Soils and agricultural land:
 - change of land use from agriculture within Main Development Area, temporary in the case of laydown areas and compounds; and
 - Temporary change of land use from agriculture for pipeline corridors.

8.7.9 Potential effects during operation may include:

- mineral resources:
 - the effect from operation of the Proposed Development on the MSA would be permanent when underlying the footprint of permanent works (south-eastern area of the Proposed CO₂ Connection Corridor), with a strip of mineral becoming sterilised, limiting the opportunity for mineral extraction.
- soils and agricultural land:
 - Sealing of agricultural land for proposed development. Repurposing of agricultural land for green infrastructure..

8.7.10 Potential effects during decommissioning may include:

- contaminated land:
 - potential impacts are considered to be the same as the construction phase.
- soils and agricultural land:
 - No activity/change to soils and agriculture.

8.7.11 Potential effects during post-construction and post-decommissioning may include:

- it is anticipated that if any remediation is carried out on potentially contaminated sites identified within the Order limits, there would, in most instances, be overall beneficial effects post-construction and post-decommissioning.

Mitigation

8.7.12 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on geology and ground conditions through the process of design development, and by embedding mitigation measures into the design of the Proposed Development. Standard construction practices would also be followed, such as the implementation of a Pollution Prevention and Emergency Response Plan and adherence to the **Framework CEMP (EN010166/APP/6.5)**.

8.7.13 Where appropriate, future monitoring and/or environmental design and management measures required to verify the predictions and/or fine tune mitigation measures, to ensure potential effects are adequately controlled, include:

- ground investigations (geo-environmental and geotechnical) would be undertaken before construction to inform the development of the preliminary and detailed design;
- investigations to target potentially contaminative sources identified, including the historical landfilling activities, Made Ground, and former coal-fired power station areas identified within the Order limits.
- the assessment of structural and engineering geology which will be undertaken during detailed design; and
- as part of further ground investigation, ground gas (including potentially from recorded workings to the west of the Main Development Area) monitoring would be undertaken.

Residual Effects and Conclusion

Construction and Decommissioning Effects

- 8.7.14 The effects on all identified receptors during the construction, post construction, decommissioning and post-decommissioning phases are expected to be **not significant**.

Operation Effects

- 8.7.15 The effects on all identified receptors during the operational phase are also expected to be **not significant**.

8.8 Landscape and Visual Amenity

- 8.8.1 **Chapter 15: Landscape and Visual Amenity (EN010166/APP/6.2.15)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to landscape and visual amenity.

Baseline Environment and Study Area

- 8.8.2 The extent of the Landscape and Visual Amenity study area is determined by the potential visibility of the Proposed Development in the surrounding landscape. It is proportionate to the size and scale of the Proposed Development and nature of the surrounding landscape. The study area has been defined by a combination of theoretical visibility analysis using modelling software and professional judgement and is described below:
- to the north approximately 5 to 13 km from the Main Development Area;
 - to the south approximately 4 to 6 km from the Main Development Area;
 - to the east approximately 10 km from the Main Development Area; and
 - to the west approximately 11 km from the Main Development Area.
- 8.8.3 Landscape and Visual Amenity receptors are described in Section 6.2.

Overview of Assessment

- 8.8.4 Potential landscape effects identified for the construction and operation phases include changes to the existing landscape character at a local and regional scale.

- 8.8.5 Potential visual effects include alterations in views for visual receptors. This would be as result of the following activities during the construction and operation phase:
- Construction:
 - permanent removal of areas of grassland;
 - removal of areas of vegetative scrub for construction laydown activities;
 - the introduction of stationary and moving plant including cranes and piling rigs and other high level construction machinery;
 - the introduction of low-level construction activities including temporary stockpiling of storage of materials, contractor/ welfare facilities and temporary laydown areas;
 - construction vehicles including Heavy Goods Vehicles (HGV) entering and leaving the Site and surrounding area; and
 - the progressive construction of tall structures including new elements of height such as the absorber columns and the HRSG stacks.
 - Operation:
 - introduction of large-scale buildings and structures within the maximum parameters set out in Section 2;
 - introduction of additional site lighting, where required for operational safety;
 - movement of additional vehicles within and around the operational area; and
 - potential visibility of plumes from the Proposed Development including cooling towers at certain times of the year.
- 8.8.6 The impacts on landscape character and visual amenity arising as a result of decommissioning of the Proposed Development are to be similar to those identified at the construction but would be shorter in duration.

Mitigation

- 8.8.7 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on Landscape and Visual Amenity through the process of design development and by embedding measures into the design of the Proposed Development.
- 8.8.8 Such measures include the layout of the Proposed Development, following a linear configuration with the massing of the main built elements 'centralised' and sited in proximity to the existing Connah's Quay Power Station. The Proposed Development has also been designed to reduce unnecessary light spill outside of the Main Development Area boundary, in accordance with a **Lighting Strategy (EN010166/APP/7.22)**. Suitable materials and finishes would be used in the construction of structure to reduce reflections and to assist with breaking up the massing of the buildings and structures.

Residual Effects and Conclusion

Construction, Operation and Decommissioning Effects

- 8.8.9 The effects on all identified Landscape receptors during the construction and operation phases are expected to be **not significant**.
- 8.8.10 **Significant adverse** visual amenity effects have been assessed for the following viewpoints during construction and operation scenarios:
- Viewpoint 8 (Flintshire Castle, Castle Dyke Street, Flint and Flintshire);
 - Viewpoint 9 (Chester Road, Oakenholt, Flint and Flintshire);
 - Viewpoint 10 (Kelsterton Road, Rockcliffe, Connah's Quay); and
 - Viewpoint 11 (Kelsterton Cemetery, Memorial Garden, Rockcliffe, Connah's Quay, Flintshire).
- 8.8.11 A number of dynamic or transient views from the Dee Estuary and users of the National Cycle Route 5 and the PRow on the north bank of the River Dee, similar to views illustrated in Viewpoints 4 and 8, are also likely to experience effects during all assessment scenarios, which is **significant**.
- 8.8.12 The effects on all other identified Visual receptors during the construction and operation phases are expected to be **not significant**.

8.9 Physical Processes

- 8.9.1 **Chapter 16: Physical Processes (EN010166/APP/6.2.16)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to Physical Processes.

Baseline Environment and Study Area

- 8.9.2 The study area has been defined to include physical processes features likely to be at risk from possible direct and indirect impacts arising from the Proposed Development.
- 8.9.3 The key receptors associated with the Physical Processes assessment include the Dee Estuary SPA, SAC & Ramsar, SSSI, as well as estuary / river bed morphology and hydrodynamics, and water column of the River Dee. Physical processes act as a pathway which has the potential impact other receptors, such as increased deposition of sediments which could disturb benthic habitats.

Overview of Assessment

- 8.9.4 Physical Processes effects during construction may include:
- increased water column turbidity and increased levels of suspended sediment concentrations; and
 - release of contaminants into the water column due to estuary bed disturbance
- 8.9.5 Potential effects during operation phase may include:

- increased water column turbidity / increased suspended sediment concentrations due to estuary bed scour;
- impacts on bed morphology associated with maintenance procedures (air blast system);
- impacts on bed morphology associated with cooling water abstraction and discharge; and
- potential release of sediment-bound contaminants into the water column due to estuary bed disturbance

8.9.6 Decommissioning activities are assumed to be limited to filling of the pipework, with the cooling water infrastructure remaining in-situ. The Proposed Development would not have any impact on the physical marine environment due to the absence of any pathway.

Mitigation

8.9.7 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on Physical Processes through the process of design development, and through the following embedded mitigation measures:

- a compressed air blast / jet washing system would be used to clear any build-up of silt on the intake screens, thus avoiding any requirement for maintenance dredging; and
- replacement of the existing intake screens rather than complete refurbishment of the related infrastructure. The requirement for a cofferdam and other potential disturbances to the river bed during the construction phase is therefore avoided.

8.9.8 No additional mitigation or enhancement related to physical processes is required.

Residual Effects and Conclusion

8.9.9 The effects on all identified receptors during the construction, operation and decommissioning phase are expected to be **not significant**.

8.10 Terrestrial Heritage

8.10.1 **Chapter 17: Terrestrial Heritage (EN010166/APP/6.2.17)** ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to Terrestrial Heritage assets to identify designated assets with the potential to be affected by the Proposed Development.

Baseline Environment

8.10.2 A 3 km study area from the Construction and Operation Area was used within the terrestrial heritage assessment for designated assets. A wider study area was set at 5 km from the Construction and Operation Area for designated assets of higher value (World Heritage Sites, scheduled monuments, Grade I and II* listed buildings, Registered Parks and Gardens

and Conservation Areas). A study area of 1 km from the Construction and Operation Area was set to identify non-designated heritage assets.

8.10.3 Terrestrial Heritage receptors are described in Section 6.2.

Overview of Assessment

8.10.4 Terrestrial Heritage effects during construction may include:

- temporary impacts to assets as a result of change to their setting derived from construction-related activities such as noise, lighting and vehicle movements;
- permanent impacts to assets as a result of change to their setting derived from the physical presence of the Proposed Development; and
- permanent physical impacts to below ground archaeological remains.

8.10.5 Potential effects during operation may include:

- [continuation of the construction phase](#) permanent impacts to assets as a result of change to their setting derived from the physical presence of the Proposed Development.

8.10.6 Potential effects during decommissioning may include:

- temporary impacts to assets as a result of change to their setting derived from construction-related activities such as noise, lighting and vehicle movements.

Mitigation

8.10.7 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on terrestrial heritage through the process of design development, and by embedding measures into the design of the Proposed Development. Embedded measures outlined within the **Framework CEMP (EN010166/APP/6.5)** would be used to control noise and visual intrusion during the construction and operation phases, to reduce the effects upon heritage assets. No additional mitigation or enhancement related to built heritage is required.

8.10.8 Potential impacts to below ground archaeological remains that cannot be avoided by design can be mitigated through a proportionate programme of archaeological investigation, recording and reporting, in advance of construction, which would form additional mitigation measures.

8.10.9 Additional mitigation measures comprise archaeological monitoring and recording during construction within the Proposed CO₂ Connection Corridor. In addition, a protocol for unexpected archaeological discoveries has also been agreed. The scope of these mitigation measures is set out within an **Overarching Written Scheme of Investigation for Terrestrial and Marine Heritage Mitigation (EN010166/APP/6.8)** which has been agreed with Clwyd Powys Archaeological Trust (CPAT) and the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW).

Residual Effects and Conclusion

Construction and Decommissioning effects

~~8.10.10~~ During the construction phase there would be a **significant** effect on associated with the loss of Open Mosaic Habitat in the short term. This effect would remain until the Open Mosaic Habitat is designated within the C&IEA. In addition, linked to the loss of this habitat there would be a moderate adverse **significant** effect on Terrestrial Invertebrates. This effect would remain until the Open Mosaic Habitat is designated within the C&IEA

~~8.10.11~~ 8.10.10 The effects on all other identified Terrestrial Heritage receptors during the construction phase for all potential impacts are expected to be **not significant**.

~~8.10.12~~ 8.10.11 ~~The~~ It is assumed that there would be no additional impacts on below ground archaeological remains during decommissioning activities. Decommissioning would be undertaken within the same footprint used during construction and therefore any potential impact to below ground archaeological remains would have already occurred, and where relevant, the impacts would have been mitigated, at the construction phase. Therefore, the effects during the decommissioning phase are expected to be similar or less ~~than the,~~ for all potential impact pathways, than during the construction phase and are therefore considered to be **not significant**.

Operation Effects

~~8.10.12~~ The During the operation phase there would be no additional physical impacts to below ground archaeological remains. Therefore, there would be **no significant effects** beyond those that have been assessed for construction impacts.

~~8.10.13~~ During operation, impacts associated with the presence of the Proposed Development in relation to the setting of assets are considered as a continuation of the permanent construction phase impacts. All effects on ~~all other identified receptors~~ the setting of assets during the operation phase are also expected to be assessed as not significant.

~~8.10.14~~ 8.10.14 Other impacts related to operational activities, such as noise and vehicle movements for staff access, are not considered to result in any change to the assessed levels of impact resulting from the physical presence of the Proposed Development within the setting of heritage assets. Therefore, they are assessed as **not significant**.

8.11 Marine Heritage

8.11.1 **Chapter 18: Marine Heritage (EN010166/APP/6.2.18)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to marine heritage.

Baseline Environment

8.11.2 The study area comprises the Water Connection Corridor (both above and below Mean High Water (MHW) and the Surface Water Outfall area with a 1 km buffer (the study area). This study area was chosen to provide sufficient

spatial context from existing historic environment records in order to develop a baseline for this assessment.

- 8.11.3 The existing baseline has been developed through a combination of desk study and field surveys. The desk study found that, within the Water Connection Corridor and the Surface Water Outfall area, there are no designated marine sites, no known shipwreck sites or aviation sites, no prehistoric sites and no recorded marine and aviation losses. A number of assets were found to be located within the wider study area which are not anticipated to be impacted by the Proposed Development and were therefore not further assessed.

Overview of Assessment

- 8.11.4 Marine Heritage effects during construction may include:

- direct and indirect impacts on previously unrecorded marine heritage assets within the Water Connection Corridor; and
- direct and indirect impacts on previously unrecorded marine heritage assets within the Surface Water Outfall Area.

- 8.11.5 Potential effects during operation may include:

- direct and indirect impacts from maintenance on previously unrecorded marine heritage assets in the Water Connection Corridor; and
- indirect impacts from operation of proposed surface water outfall on unrecorded marine heritage assets in the Surface Water Outfall Area.

- 8.11.6 Decommissioning activities are assumed to be limited to filling of the pipework, with the cooling water infrastructure remaining *in-situ*. There is therefore no pathway for any impacts on marine heritage assets during this phase. The decommissioning phase has been scoped out of the marine heritage assessment as no works would be expected to occur in the marine environment.

Mitigation

- 8.11.7 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on marine heritage through the process of design development, and by embedding measures into the design of the Proposed Development. Embedded measures include commitments to undertake works in a manner that would not require interaction with the riverbed and adherence to the **Framework CEMP (EN010166/APP/6.5)**.

- 8.11.8 Additional mitigation measures comprise the **Overarching Written Scheme of Investigation for Terrestrial and Marine Heritage Mitigation (EN010166/APP/6.8)**. The measures set out in this document relevant to marine heritage include a watching brief during excavation works at the Surface Water Outfall Area and a walkover to assess erosion once the outfall is operational, and a protocol for unexpected archaeological discoveries (PAD) to be implemented during construction works when an archaeologist is not present. The WSI has been agreed with RCAHWM and CPAT.

Residual Effects and Conclusion

Construction Effects

- 8.11.9 The effects on all identified receptors during the construction phase are expected to be **not significant**.

Operation Effects

- 8.11.10 The effects on all other identified receptors during the operation phase are also expected to be **not significant** following consideration of additional mitigation.

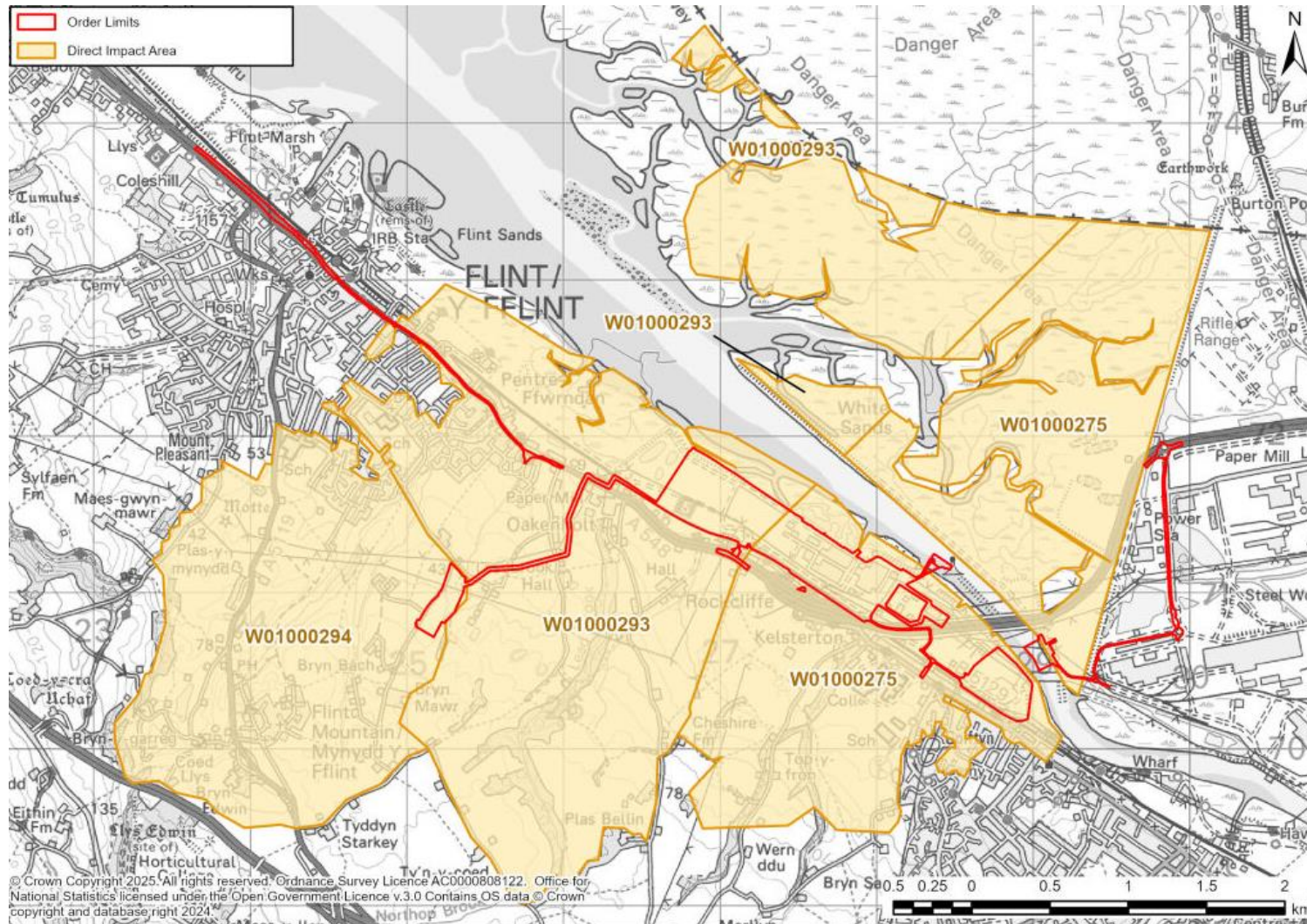
8.12 Socio-economics, Recreation and Tourism

- 8.12.1 **Chapter 19: Socio-economic, Recreation and Tourism (EN010166/APP/6.2.19)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to socio-economics, recreation and tourism.

Baseline Environment and Study Area

- 8.12.2 The current baseline has been established through gathering data on populations, businesses, employment and training, economic growth, land uses, communities, private assets, recreational routes and PRow within the Order limits and the wider local authority area of FCC.
- 8.12.3 The socio-economic, recreation and tourism has been assessed using three geographies, namely:
- A Direct Impact Area, consisting of three areas in Flintshire, as shown in Plate NTS 17;
 - The Wider Impact Area, comprising the area of FCC; and
 - The national comparator, Wales.
- 8.12.4 The population of the Direct Impact Area is 5,779 (based on Census 2021), approximately 3.7% of Flintshire's 154,962 population and approximately 0.19% of Wales 3,107,494 population. The Direct Impact Area exhibits the smallest proportion of individuals aged 65+ (17%) and the largest proportion of individuals aged 15 to 64 (66%).
- 8.12.5 Within the Direct Impact Area, the workforce has a notable proportion of mid-level qualifications with fewer extremes of high and no qualifications with 65.6% of the population classed as in employment or awaiting to start a job. The unemployment rate is 2.3%. Education dominates employment in the Direct Impact Area, with 14.7% of the working population in professional occupations.
- 8.12.6 There are multiple open spaces, PRows within the study area of 500 m of the Order limits. The majority of community facilities are concentrated around Connah's Quay and Oakenholt. The Deeside Naturalists Society Field Study Centre is located within the Order Limits. Residential receptors are described in Section 6.2.

Plate NTS 17: Direct Impact Areas



Overview of Assessment

8.12.7 Socio-economics, Recreation and Tourism effects during construction and decommissioning may include:

- beneficial effects on the economy through the generation of jobs during construction and decommissioning;
- Gross Value Added (GVA) to the Flintshire and Wrexham economy due to the generation of jobs;
- increased demand for local accommodation facilities during construction and decommissioning;
- beneficial effects on the availability of skills and training
- the closure and diversion of PRow during construction;
- the closure and diversion of local highways;
- increased traffic demand on the strategic road network and Kelsterton Road during construction and decommissioning;
- the temporary loss of agricultural land during construction and decommissioning;
- adverse impacts on the amenity of residents, businesses, users of community facilities and visitor attractions due to noise, air quality, visual and traffic effects during construction and decommissioning; and
- loss of development land.

8.12.8 Potential effects during operation may include:

- Beneficial effects on the economy through the generation of jobs; GVA to the Flintshire and Wrexham economy due to the generation of jobs;
- increased demand for local accommodation facilities during operation during planned maintenance outages;
- severance to PRow;
- the permanent loss of agricultural land;
- adverse impacts on the amenity of residents, businesses, users of community facilities and visitor attractions due to noise, air quality, visual and traffic effects; and
- loss of development land.

Mitigation

8.12.9 The Proposed Development has been designed, as far as possible, to avoid or minimise adverse impacts and effects on socio-economics, recreation and tourism through the process of design development.

8.12.10 Embedded mitigation measures are incorporated into the Proposed Development as set out in the respective assessment chapters. Of particular relevance to socio-economics, recreation and tourism are those detailed in the **Framework CEMP (EN010166/APP/6.5)** related to noise and vibration, air quality, traffic and transport, and landscape and visual amenity as these

embedded mitigation measures reduce the potential for effects on the local community and existing facilities.

8.12.11 No additional mitigation or enhancement related to socio-economics, recreation and tourism is required.

Residual Effects and Conclusion

Construction and Decommissioning Effects

8.12.12 The effects on all identified receptors during the construction phase are expected to be **not significant**.

8.12.13 The effects during the decommissioning phase are expected to be similar or less than the during the construction phase and are therefore considered to be **not significant**.

Operation Effects

8.12.14 The effects on all identified receptors during the operational phase are also expected to be **not significant**.

8.13 Climate Change

8.13.1 **Chapter 20: Climate Change (EN010166/APP/6.2.20)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to Climate Change. The assessment addresses three separate aspects:

- lifecycle greenhouse gas (GHG) impact assessment;
- in-combination climate change impact (ICCI) assessment; and
- climate change resilience (CCR) assessment.

Baseline Environment and Study Area

Lifecycle Greenhouse Gas Assessment

8.13.2 The study area for the Lifecycle GHG Assessment includes:

- all direct GHG emissions arising from within the Order limits across the construction, operation, and decommissioning phases of the Proposed Development; and
- indirect GHG emissions occurring outside of the Order limits but ultimately relate to the Proposed Development. For example, this includes embodied GHG emissions resulting from the upstream production and transportation of the construction materials, waste processing and waste disposal.

8.13.3 The existing baseline comprises of the GHG attributed to the energy generation during the lifetime of Proposed Development.

Climate Change Resilience Assessment

8.13.4 The study area for the CCRA is the area of temporary and completed works within the Order limits and surrounding areas that may impact the Order limits.

8.13.5 The baseline for the CCRA is based on historical climate data obtained from the Met Office from the closest meteorological station to the Order limits. Past extreme events include the highest recorded temperature of 37.1 °C in July 2022, heavy rainfall from Storm Babet in October 2023 and extensive flooding in July 2023.

In Combination Climate Change Impact Assessment

8.13.6 The study area for the ICCI assessment is based on historic climate data obtained from the Met Office as described above.

Overview of Assessment

Lifecycle GHG Assessment

8.13.7 The Lifecycle GHG assessment considers the impact of GHG emissions arising over the lifetime of the Proposed Development on the climate, assessing the magnitude of GHG attributed to the Proposed Development during the construction, operation and decommissioning phases.

CCRA

8.13.8 The CCRA has been carried out to assess the resilience of the Proposed Development to the impacts of future climate change.

8.13.9 The risks assessed in the CCRA at the construction phase of the Proposed Development predominantly cover workforce exposure to dangerous working conditions and damage to physical structures/asset damage.

8.13.10 The nature of risks during decommissioning are considered similar to those during construction.

8.13.11 The risks assessed in the CCRA at the operational phase of the Proposed Development predominantly encapsulate asset damage from extreme weather conditions and changes in annual precipitation and temperatures, as well as workforce exposure to dangerous working conditions.

ICCI Assessment

8.13.12 The ICCI assessment has been carried out to identify how the resilience of receptors in the surrounding environment are affected by the combined impact of future climate conditions and the Proposed Development.

8.13.13 The following ICCIs have been identified during the construction:

- increase in winter precipitation rate impacting Traffic and Transport receptors;
- decrease in summer precipitation rate, increase in winter precipitation rate, sea level rise, storm surges, increase in occurrences of drought and increase in winter rainfall impacting Water Environment receptors;
- increase in annual temperature impacting Geology and Ground Conditions receptors; and
- increase in mean annual maximum air temperature impacting Human Health receptors.

8.13.14 The following ICCIs have been identified during the operation:

- change in mean annual air temperature impacting Air Quality receptors;
- increase in mean summer air temperature impacting NSRs;
- increase in winter rainfall and increased droughts / reduced water levels in summer impacting Aquatic Ecology receptors; and
- increase in winter rainfall, increased rainfall intensity, increased sea levels and storm surge, increased sea temperature and increased droughts impacting Water Environment receptors.

Mitigation

8.13.15 The Proposed Development has been designed, as far as possible, to:

- avoid or minimise GHG impacts and their resultant effects on the climate;
- be resilient to the impacts of climate change; and
- avoid or minimise impacts and effects on receptors in the surrounding environment, as a result of the combined impacts of the Proposed Development and Climate Change.

8.13.16 The use of carbon capture and storage (with at least a 95% carbon capture rate) on dispatchable gas-fired generation is a key technology that will enable the UK, and more specifically Wales, to transition towards net-zero emissions by 2050; this contributes towards a secure energy supply and support the UK's transition to a decarbonised energy system.

8.13.17 Embedded mitigation measures that are incorporated into the Proposed Development with regard to climate change include:

- standard construction practices and standard operation mitigation such as the implementation and maintenance of an Environmental Management System (EMS) which would be certified to ISO 14001;
- A DEMP would be produced before the commencement of decommissioning using appropriate guidance and legislation at the time and would likely be similar to that of the construction phase but reflect future climatic conditions; and
- The Greenhouse Gas (GHG) Reduction Strategy (**Appendix 20-E: Greenhouse Gas Reduction Strategy (EN010166/APP/6.4)**), which sets out how the GHG emissions associated with the Proposed Development should be managed and reduced, including a framework for identifying and prioritising GHG reduction opportunities. This strategy covers GHG reduction opportunities across the Proposed Development's construction, operation, and decommissioning phases.

8.13.18 A number of adaptation measures have been identified for consideration during the design, construction and operation of the Proposed Development. These measures are part of the process of adjustment to actual or expected climate and its effect to increase resilience, moderate harm and exploit beneficial opportunities.

8.13.19 No additional mitigation or enhancement related to Climate Change is required.

Residual Effects and Conclusion

Lifecycle GHG Assessment

- 8.13.20 **No significant effects** are anticipated across the construction and decommissioning phases of the Proposed Development on Lifecycle GHG.
- 8.13.21 The operational GHG impact of the Proposed Development is shown to contribute to an ever-increasing proportion of both the UK and Welsh Carbon Budgets. When viewing the operational GHG impact of the Proposed Development on the UK and Welsh Carbon Budgets (as a proxy for the global climate), the impacts are assessed as adverse and **significant**.

CCRA

- 8.13.22 As a result of the adaptation climate change mitigation measures it is concluded that all residual climate change risks during the construction phase have been identified to be **not significant**.
- 8.13.23 The nature of risks during decommissioning are considered similar to those during construction.
- 8.13.24 As a result of the adaptation climate change mitigation measures it has been concluded that all residual climate change risks during the operation phase have been identified to be **not significant**.

ICCI Assessment

- 8.13.25 The ICCI Assessment concludes that there are **no significant** residual ICCIs on receptors in the surrounding environment identified.

8.14 Human Health

- 8.14.1 **Chapter 21: Human Health (EN010166/APP/6.2.21)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to human health.

Baseline Environment and Study Area

- 8.14.2 The study area for the human health assessment is defined to include features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development. The study area is based on the extent and characteristics of the Proposed Development and the communities/wards directly and potentially indirectly affected by the Proposed Development. It is determined that human health impacts are likely to occur in an area which is composed of the following four wards, which are together referred to as the 'study area':
- Connah's Quay: Golftyn;
 - Flint: Castle;
 - Flint: Coleshill and Trelawny; and
 - Flint: Oakenholt.
- 8.14.3 The baseline reports population, an age breakdown, ethnicity breakdown, education, economic activity, income, deprivation, general health, mental health, disability, and provides context on availability of healthcare facilities,

social, community and recreational facilities, PRow and the presence of electromagnetic fields.

Overview of Assessment

8.14.4 The Proposed Development has the potential to result in a wide range of effects during the construction, operation and decommissioning stages. The following potential impacts have been identified: during the construction, operation and decommissioning phases:

- adverse impacts on access to healthcare services;
- beneficial impacts on employment and income;
- beneficial impacts on education and training;
- transport impacts on access to health services and other social infrastructure;
- reduced air quality;
- increased exposure to noise;
- adverse impacts on access to open space, leisure and play;
- adverse impacts on climate change; and
- a reduction in water quality.

Mitigation

8.14.5 The Proposed Development has been designed, as far as possible, to avoid or minimise adverse impacts and effects on human health through the process of design development. Standard embedded mitigation measures that are incorporated into the Proposed Development with regard to Human Health include standard construction practices and adherence to the **Framework CEMP (EN010166/APP/6.5)** and **CTMP (EN010166/APP/6.6)**.

8.14.6 No additional mitigation or enhancement related to human health is required.

Residual Effects and Conclusion

Construction and Decommissioning Effects

8.14.7 The effects on all identified receptors during the construction phase are expected to be **not significant**.

8.14.8 The effects during the decommissioning phase are expected to be similar or less than the during the construction phase and are therefore considered to be **not significant**.

Operation Effects

8.14.9 The effects on all identified receptors during the construction phase are also expected to be **not significant**.

8.15 Major Accidents and Disasters

8.15.1 **Chapter 22: Major Accidents and Disasters (EN010166/APP/6.2.22)** of ES Volume II presents the findings of an assessment of the likely significant

environmental effects of the Proposed Development with respect to Major Accidents and Disasters (MA&Ds).

Baseline Environment and Study Area

8.15.2 The study area for assessment of MA&Ds is not defined within regulatory guidance or a standardised methodology, as such a study area of 5 km from the Main Development Area has been considered based on professional experience and judgement, ensuring that sensitive resources and receptors are included. The 5 km study area accounts for the likely maximum Zol over which risk events from the Proposed Development have potential to result in significant MA&Ds effects on relevant environmental receptors.

8.15.3 The baseline relevant to major accidents and disasters comprises:

- Features external to the Proposed Development that contribute a potential source of hazard to the Proposed Development itself;
- Sensitive environmental receptors at risk of a significant effect, as described in each of the technical chapters of ES Volume II (as summarised in Section 6.2); and
- Identified major accident and disaster risks which currently exist within the local area.

Overview of Assessment

8.15.4 The following MA&Ds risk events have been identified during construction:

- ground instability;
- structural collapse / accidental impact;
- utility (pipeline or electrical cable) strike / Unexploded Ordnance (UXO) impact;
- domino effects with neighboring Control of Major Accident Hazards (COMAH) establishments;
- accidental vehicle impact;
- aircraft / Drone impact; and
- vandalism.

8.15.5 The following MA&Ds risk events have been identified during commissioning:

- wet testing of equipment and charging storage vessels with gases and chemicals for the first time; and
- testing of critical instrument and control systems.

8.15.6 The following MA&Ds risk events have been identified during operation:

- fire and / or explosion of natural gas;
- asphyxiant gas release - CO₂;
- release of amine solution;
- domino event - industrial;

- coastal / fluvial flooding;
- aircraft / drone impact; and
- vandalism.

8.15.7 The following MA&Ds risk events have been identified during decommissioning phase, considering the likely hazardous substances and identified:

- the release of residual inventory substances used during operational phase.

Mitigation

8.15.8 The Proposed Development has been designed, as far as possible, to avoid or minimise adverse impacts and effects in relation to MA&Ds through the design development process. The credible scenarios identified for each phase of the Proposed Development have been assessed as having a level of risk which is tolerable or tolerable-if As Low As Reasonably Practicable (ALARP), based on the information available at this time.

8.15.9 The facility would require an Environmental Permit, for the operation of the combustion plant and the CCP, under the Environmental Permitting Regulations (Ref. 22). The Environmental Permitting regime is enforced by NRW and places several conditions and requirements to be fulfilled. These including the use of appropriate control and monitoring procedures, risk assessments, management systems and control measures; to minimise the risk of accidents occurring, minimise the effects of any such accidents on off-site receptors as well as on the operational workforce.

8.15.10 Embedded mitigation measures include:

- the **Framework CEMP (EN010166/APP/6.5)** sets out how construction activities would be managed and controlled in compliance with accredited health and safety and environmental management systems, relevant legislation and environmental permits, consents and licenses. This would be finalised prior to the start of construction;
- the **Framework CTMP (EN010166/APP/6.6)** sets out how traffic would be controlled onsite to eliminate incidents between workers and / or plant and equipment. This would be finalised prior to the start of construction;
- Ground Investigations (GIs) are required under Environmental Permitting to assess the underlying stratigraphy and characterise underlying soil and groundwater conditions which will inform the structural and civil design of the Proposed Development;
- in compliance with the Construction (Design & Management) Regulations (CDM) 2015 (Ref. 20) the undertaker would develop and provide pre-construction information to the Principal Contractor(s), as soon as is practicable with the formal appointment of the principal designer and principal contractor (normally the roles are undertaken by the appointed Principal Contractor(s));

- in compliance with Regulation 6 of the CDM Regulations 2015 (Ref. 20), a notification of construction works would be submitted to the Health and Safety Executive prior to the commencement of construction;
- the Proposed Development's contractor(s) would comply with relevant health and safety legislation, i.e., Health and Safety at Work Act 1974 (Ref. 21);
- the contractor(s) would ensure that a final health and safety file is prepared and handed to the undertaker. This would identify any environmental, health and safety information about the Proposed Development likely to be needed during any subsequent work activities;
- the use of suitably experienced contractors, risk assessments, working method statements, operating procedures and personnel training would minimise the risk of accidental scenarios occurring during the Proposed Development construction; and
- atypical activities, which would be undertaken during construction, but not in normal operation, would be assessed as part of the risk assessment and mitigation processes. For example, the refuelling of construction vehicles from temporary diesel storage areas would be subject to both procedural and infrastructure measures to prevent spillages of fuel.

8.15.11 No additional mitigation or enhancement related to MA&Ds is required.

Residual Effects and Conclusion

Construction, Commissioning, Operation and Decommissioning Effects

8.15.12 The following risks are considered tolerable-if as low as reasonably practicable:

- domino effects with neighbouring COMAH establishments during construction;
- wet testing of equipment and charging storage vessels during commissioning;
- testing of critical instrument and control systems during commissioning;
- major release of natural gas-fire and / or explosion during operation;
- major release of asphyxiant - CO₂ during operation;
- major release of amine solution during operation;
- release of toxic substances entrained in firewater effluent during operation;
- domino effects with neighbouring COMAH establishments during operation; and
- flooding during operation

8.15.13 Risks categorised as tolerable-if as low as reasonably practicable are considered **not significant**. However, they require further assessment to determine what control measures are required as “reasonably practicable” for the detailed design of the plant and equipment to be used on the Proposed Development. As the site is expected to be regulated under The Control of Major Accident Hazards (COMAH) Regulations 2015 (), a pre-construction safety report would be submitted to the COMAH Competent Authority to be assessed before construction commences. This pre-construction safety report would include the preventative and mitigating control measures to be included, which would have been determined through quantitative and qualitative risk assessment methods. Regardless of the COMAH status of the Main Development Area, the undertaker would undertake any necessary studies, where required by UK legislation and industry good practice, to support the safe design, construction, commissioning, operation (including maintenance) and decommissioning of the Proposed Development.

8.15.14 All other risk events identified during the construction, commissioning, operation and decommissioning phases of the Proposed Development are expected to be tolerable and therefore **not significant**.

8.16 Materials and Waste

8.16.1 **Chapter 23: Materials and Waste (EN010166/APP/6.2.23)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to Materials and Waste.

Baseline Conditions and Study Area

8.16.2 Two study areas were identified in the Materials and Waste assessment:

- A Proposed Development study area: within which waste associated with the Proposed Development is generated and construction materials are used; and
- An expansive study area: within which landfills and other waste facilities that manage waste generated by the Proposed Development are likely to be located and construction materials are available.

8.16.3 The Proposed Development study area for construction and operational waste generation, and for use of construction materials (key construction materials only), comprises the Order limits. This includes temporary offices, compounds, laydown, and storage areas.

8.16.4 The expansive study area for non-hazardous and inert waste management comprises the whole of Wales, within which waste management infrastructure (specifically landfill void capacity) is located. The expansive study area for hazardous waste management is combined for Wales and England.

8.16.5 The baseline from a material assets and waste perspective covers the availability of key construction materials, potential recycled content, landfill capacity and sites, and the presence of safeguarding areas and sites within the study area. There are three historic landfill sites located within the Order limits.

Overview of Assessment

8.16.6 Materials and Waste effects during construction may include:

- changes in material availability (concrete);
- changes in material availability (aggregates, steel and asphalt);
- changes in available non-hazardous and inert waste landfill void capacity; and
- changes in available hazardous landfill void capacity (excavated material).

8.16.7 Potential effects during operation may include:

- changes in available non-hazardous and inert waste landfill void capacity.

8.16.8 Decommissioning has been scoped out of the assessment as the Proposed Development has a long design life and as such, it is not considered possible to reliably forecast decommissioning requirements and infrastructure far into the future.

Mitigation

8.16.9 The Proposed Development has been designed, as far as possible, to avoid and/or minimise the impacts and effects on Materials and Waste. This has been achieved through the process of design development, and by embedding mitigation measures into the design of the Proposed Development, including designing for reuse and recovery of waste, optimising materials used during construction, and the implementation and maintenance of and EMS which would be certified to ISO 14001.

8.16.10 A final CEMP and detailed SWMP would be prepared by the construction contractor in accordance with the **Framework SWMP** appended to the **Framework CEMP (EN010166/APP/6.5)** prior to construction.

8.16.11 No additional mitigation or enhancement related to Materials and Waste is required.

Residual Effects and Conclusion

Construction Effects

8.16.12 A potential significant effect has been identified in relation to concrete availability in Wales. In practice, due to the location of the Proposed Development close to the border between Wales and England, it is anticipated that concrete may be sourced from north-west England. Therefore, when the concrete quantity required for construction is considered in the context of a combined Wales and North West England baseline and that batch concrete facilities would be used onsite which may ease demand on local sources the effect would be **not significant**.

8.16.13 In a worst-case scenario where all hazardous waste (17,470 m³) is sent to landfill within one calendar year this would be 0.18% of the hazardous waste landfill void capacity in Wales and England (9.9 million m³), which would result in a significant effect. In practice, a proportion of hazardous waste

generated by excavation from the Proposed Development could be non-hazardous and/or likely to be sent to a waste management facility rather than disposed of to landfill, further reducing the overall quantities of waste for disposal. If 50% of hazardous waste could be recovered via off-site treatment at a waste management facility, this would reduce the magnitude of the impact to 'negligible' (0.09% of the hazardous waste landfill void capacity), resulting in a **not significant** effect. However, the worst-case (with no recovery) outlined above is used in the assessment and the effect is considered **significant**.

8.16.14 The effects on all other identified receptors during the construction phase and are expected to be **not significant**.

Operation Effects

8.16.15 The effects on the identified receptor during the operational phase is expected to be **not significant**.

8.17 Cumulative and Combined Effects

8.17.1 **Chapter 24: Cumulative and Combine Effects (EN010166/APP/6.2.24)** of ES Volume II presents the findings of an assessment of the likely significant environmental effects of the Proposed Development with respect to cumulative and combined effects.

8.17.2 Cumulative and combined effects are defined as follows:

- **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 (hereafter referred to as 'proposed schemes'); and
- **intra-project combined effects:** these are where an individual environmental receptor or resource will likely be affected by more than one type of impact as a result of the construction, operation (including maintenance) and decommissioning of the Proposed Development. For example, a residential receptor may experience air quality effects as well as noise and vibration effects, visual effects, health and wellbeing effects and socioeconomic effects.

Inter-project cumulative effects

8.17.3 The cumulative and combined effects assessment considers the construction and operation of the Proposed Development.

8.17.4 The cumulative effects assessment follows a four stage process as set out by guidance produced by the Planning Inspectorate:

- Stage 1: establishing the long list of 'other existing development and/or approved development';
- Stage 2: establishing a shortlist of 'other existing development and/or approved development';
- Stage 3: information gathering; and
- Stage 4: assessment.

8.17.5 Part of Stage 1 of the cumulative effects assessment is to assign certainty to 'other existing development and/or approved development' and give a tier rating of 1, 2 or 3 based on the amount of currently available information for the development in the public domain:

- *Tier 1*: a planning application that is under construction, has planning approval and has submitted a planning application;
- *Tier 2*: a project that is visible on the Planning Inspectorate's Programme of Projects where a scoping report has been submitted; and
- *Tier 3*: a project that is visible on the Planning Inspectorate's Programme of Projects where a scoping report has not been submitted or it is identified in a relevant Development Plan, or other plans and programmes which set a framework for future development.

Summary of Stages 1 and 2

8.17.6 The Zol for use in Stage 1 of the Cumulative Effects Assessment was determined by examining all the environmental topic study areas. From this, it is considered that a study area of 15 km from the Construction and Operation Area encompasses the maximum range of any potential likely significant cumulative effects.

8.17.7 The update of the long list used data sources including the National Infrastructure Planning website and planning portals for Flintshire County Council, Wirral Council, Cheshire West and Chester Council, Wrexham County Borough Council, Welsh Development of National Significance register and Marine Management Organisation (MMO) Marine Case Management System. A detailed copy of this Long List of proposed schemes is provided in **Appendix 24-A: Long List of Other Developments (EN010166/APP/6.4)**.

8.17.8 During the completion ES Volume II, the long list of proposed schemes continued to be updated with additional developments or information that emerged (up until a cut-off date of end of March 2025). Following consideration of feedback provided on the long list of proposed schemes at scoping phase, consultation and technical engagement, the long list of proposed schemes was reviewed and assigned a final status and tier informed by the guidance and levels presented within the Planning Inspectorate's Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment (Ref. 19). The shortlisting process involved the application of inclusion/exclusion criteria and was informed by the professional judgement of the environmental specialists undertaking the EIA and through engagement with the relevant local authorities.

8.17.9 The criteria for determining which proposed schemes to shortlist to the cumulative effects assessments, included considering the overlap of the construction of proposed schemes with the Proposed Development, the level of information available for them and their likelihood to result in cumulative effects with the Proposed Development on the basis of their scale or their potential to become a new receptor for effects from the Order limits.

8.17.10 The final short list of proposed schemes is presented in **Appendix 24-B: Short List of Other Developments (EN010166/APP/6.4)** of ES Volume IV and is shown on **Plate NTS 18**.

Summary of Stages 3 and 4

8.17.11 This stage involved searching for and reviewing available information relating to the shortlisted developments to establish the details of their likely environmental effects. For each shortlisted proposed scheme, this information has included, where available, EIA Screening Letters / Requests, EIA Scoping Reports, Environmental Reporting (including standalone reports, EIRs and ESs), other reports such as Planning Statements, or details available on a project website such as consultation material.

8.17.12 The Inter-Project Effects Assessment (stage 4) has been undertaken on a topic-by-topic basis rather than scheme-by-scheme. Each topic reviewed the shortlist of proposed schemes to establish the potential for any cumulative effects to occur. Where necessary, a narrative was provided to support the findings of each cumulative assessment undertaken for each technical topic and the details were provided within **Chapter 24: Cumulative and Combine Effects (EN010166/APP/6.2.24)** of ES Volume II.

8.17.13 Due to the incorporation of both embedded and additional mitigation measures within the Proposed Development and associated with the other identified developments, it is not anticipated that any significant cumulative effects would occur, during either the construction, operation or decommissioning phases for the following topics:

- air quality;
- noise and vibration;
- traffic and transport;
- terrestrial and aquatic ecology;
- marine ecology;
- geology and ground conditions;
- water environment and flood risk;
- physical processes;
- marine heritage;
- climate change;
- major accidents and disasters; and
- materials and waste

8.17.14 The following **significant** cumulative effects have been identified during construction (and decommissioning):

- Landscape, for developments in close proximity to the Proposed Development (adverse);
- Visual Amenity, for developments in close proximity to the Proposed Development (adverse);

- Change to the setting of the Croes Atti Roman Site (FL213) scheduled monument (adverse);
- Net Construction Employment (beneficial); and
- Employment and Income human health determinant (beneficial).

8.17.15 The following significant cumulative effect have been identified during operation:

- Climate Change Mitigation and Adaption human health determinant (sub-population only) (beneficial).

Intra-Project Effects

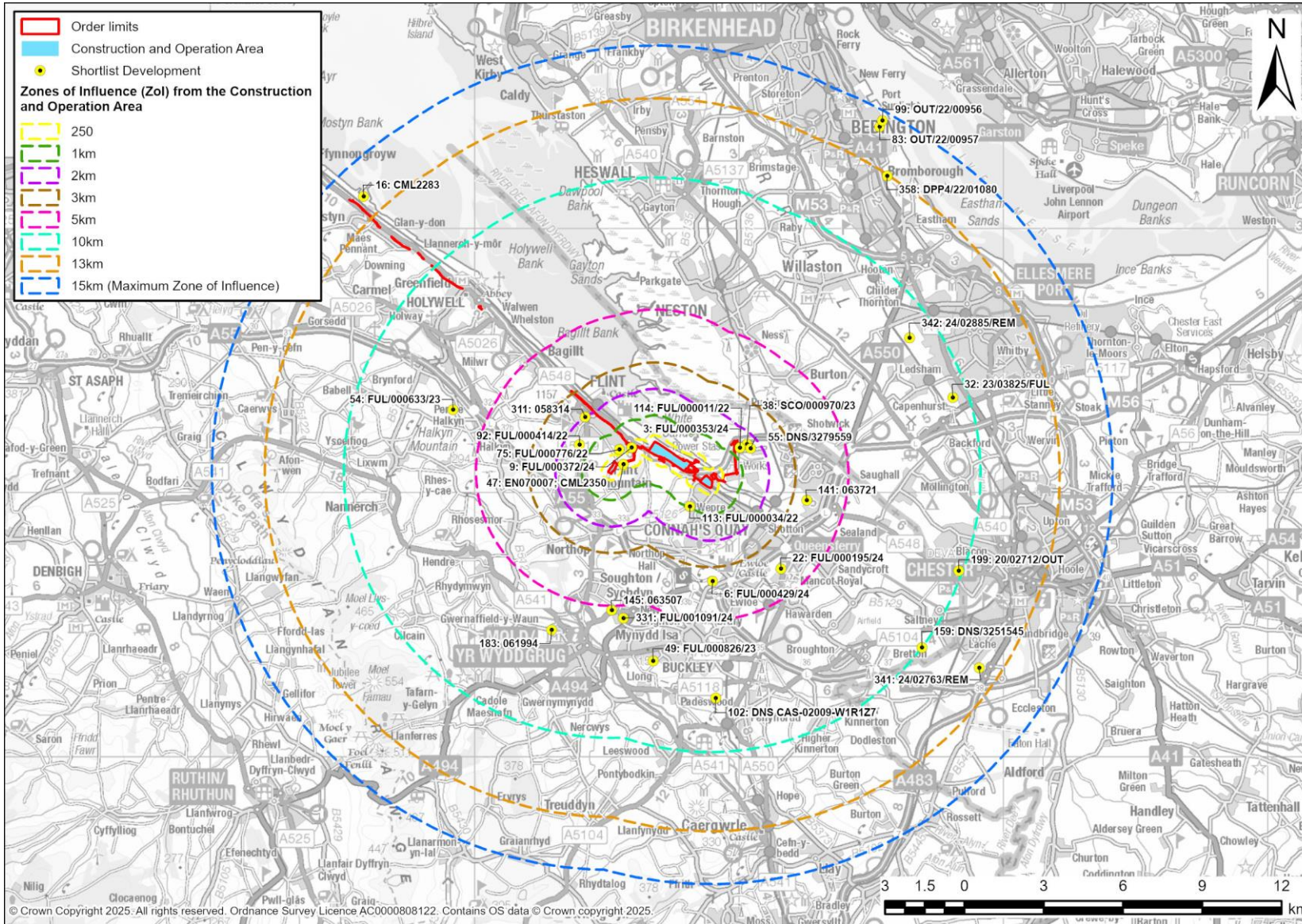
8.17.16 The assessment of intra-project effects involves the identification of those receptors that have the potential to be affected by more than one type of impact as a result of the construction, operation or decommissioning of the Proposed Development. These residual effects are identified from the ES technical assessments and include those receptors who are concluded to be likely to experience a residual effect of minor or greater magnitude. For example, a residential receptor may experience air quality effects as well as noise and vibration effects, visual effects, health and wellbeing effects and socioeconomic effects.

8.17.17 It is considered that during the construction (and decommissioning) of the Proposed Development there is potential for the following receptors to experience a new or different environmental effect associated with the combination of visual and noise effects:

- Residential Properties West end of Kelsterton Road;
- Kelsterton Farm; and
- Residential Properties at Kelsterton Lane / Kelsterton Road intersection

8.17.18 No new or different environmental effect have been identified during the operation of the Proposed Development.

Plate NTS 18: Short List of Cumulative Developments



9. Summary of Residual Effects

9.1.1 This section provides an overview of the identified significant adverse effects and also confirms where no significant adverse or beneficial effects have been identified. Significant effects are those effects which have been classed as being of either Major or Moderate significance which remain after the consideration and adoption of both embedded and additional mitigation measures.

Construction

- **Air Quality:** No significant effects are predicted to occur;
- **Noise and Vibration:** the noise and vibration assessment determined that Noise Sensitive Receptors 21 and 22 (including the travellers' encampment) would experience a temporary moderate adverse effect from road traffic noise levels as a result of the construction traffic associated with the Proposed Development which is **Significant**;
- **Traffic and Transport:** No significant effects are predicted to occur;
- **Terrestrial and Aquatic Ecology:** During the construction phase there would be **significant** effects in the short term associated with the loss of Open Mosaic Habitat, on the habitat itself and its associated terrestrial invertebrate community. This effect would remain until the Open Mosaic Habitat is designated within the C&IEA;
- **Marine Ecology:** No significant effects are predicted to occur;
- **Water Environment and Flood Risk:** No significant effects are predicted to occur;
- **Geology and Ground Conditions:** No significant effects are predicted to occur;
- **Landscape and Visual Amenity:** The visual amenity assessment has determined that recreational users at Viewpoints 8, 9, 10 and 11, and the dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and ProW on the north bank of the River Dee are likely to experience **significant** adverse effects during the construction phase of the Proposed Development as a result of construction activity;
- **Physical Processes:** No significant effects are predicted to occur;
- **Terrestrial Heritage:** No significant effects are predicted to occur;
- **Marine Heritage:** No significant effects are predicted to occur;
- **Socio-Economics, Recreation and Tourism:** No significant effects are predicted to occur;
- **Climate Change:** No significant effects are predicted to occur;
- **Human Health:** No significant effects are predicted to occur;

- **Major Accidents and Disasters:** No significant effects are predicted to occur;
- **Materials and Waste:** The materials and waste assessment has determined that the changes in available hazardous landfill void capacity – excavated material would result in a moderate or large adverse effect which is **significant**;
- **Cumulative and Combined Effects (Landscape and Visual):** there is potential for **significant** adverse cumulative landscape and visual effects with developments in close proximity to the Proposed Development;
- **Cumulative and Combined Effects (Terrestrial Heritage):** There is potential for **significant** adverse cumulative effects associated with the Change to the setting of the Croes Atti Roman Site (FL213) scheduled monument;
- **Cumulative and Combined Effects (Socio-economics, Recreation and Tourism):** there is potential for **significant** beneficial effects associated with net construction employment;
- **Cumulative and Combined Effects (Human Health):** there is potential for **significant** beneficial effects associated with the Employment and Income human health determinant;
- **Cumulative and Combined Effects (Intra-project effects):** there is potential for the receptors at Residential Properties West end of Kelsterton Road, Kelsterton Farm; and Residential Properties at Kelsterton Lane / Kelsterton Road intersection to experience a new or different environmental effect associated with the combination of adverse visual and noise effects.

Operation

- **Air Quality:** No significant effects are predicted to occur;
- **Noise and Vibration:** No significant effects are predicted to occur;
- **Traffic and Transport:** No significant effects are predicted to occur;
- **Terrestrial and Aquatic Ecology:** No significant effects are predicted to occur;
- **Marine Ecology:** No significant effects are predicted to occur;
- **Water Environment and Flood Risk:** No significant effects are predicted to occur;
- **Geology and Ground Conditions:** No significant effects are predicted to occur;
- **Landscape and Visual Amenity:** The visual amenity assessment has determined that recreational users at Viewpoints 8, 9, 10 and 11, and the dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and PRoW on the north bank of the River Dee are likely to experience significant adverse effects during the operation phase of the Proposed Development;
- **Physical Processes:** No significant effects are predicted to occur;

- **Terrestrial Heritage:** No significant effects are predicted to occur;
- **Marine Heritage:** No significant effects are predicted to occur;
- **Socio-Economics, Recreation and Tourism:** No significant effects are predicted to occur;
- **Climate Change:** the climate change assessment has determined that the Impact of greenhouse gas (GHG) emissions arising during the operation of the Proposed Development would produce a moderate adverse effect, which is **significant**, in relation to the overall and ever decreasing UK and Welsh carbon Budgets and the global atmosphere;
- **Human Health:** No significant effects are predicted to occur;
- **Major Accidents and Disasters:** No significant effects are predicted to occur; and
- **Materials and Waste:** No significant effects are predicted to occur; and
- **Cumulative and Combined Effects (Human Health):** there is potential for **significant** beneficial effects associated with the Climate change Mitigation and Adaption human health determinant; (sub-population only).

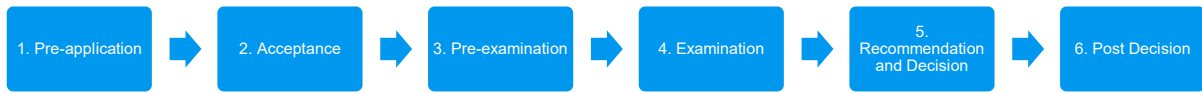
Decommissioning

- **Air Quality:** No significant effects are predicted to occur;
- **Noise and Vibration:** the noise and vibration assessment determined that Noise Sensitive Receptors 21 and 22 (including the travellers' encampment) would experience a temporary moderate adverse effect from road traffic noise levels as a result of the construction traffic associated with the Proposed Development which is **Significant**;
- **Traffic and Transport:** No significant effects are predicted to occur;
- **Terrestrial and Aquatic Ecology:** No significant effects are predicted to occur;
- **Marine Ecology:** No significant effects are predicted to occur;
- **Water Environment and Flood Risk:** No significant effects are predicted to occur;
- **Geology and Ground Conditions:** No significant effects are predicted to occur;
- **Landscape and Visual Amenity:** The visual amenity assessment has determined that recreational users at Viewpoints 8, 9, 10 and 11, and the dynamic views in close proximity to the Main Development Area including Dee Estuary, NCR 5, and PRoW on the north bank of the River Dee are likely to experience significant short-term adverse effects during the decommissioning phase of the Proposed Development as a result of decommissioning activities;
- **Physical Processes:** No significant effects are predicted to occur;
- **Terrestrial Heritage:** No significant effects are predicted to occur;
- **Marine Heritage:** No significant effects are predicted to occur;

- **Socio-Economics, Recreation and Tourism:** No significant effects are predicted to occur;
- **Climate Change:** No significant effects are predicted to occur;
- **Human Health:** No significant effects are predicted to occur;
- **Major Accidents and Disasters:** No significant effects are predicted to occur;
- **Materials and Waste:** No significant effects are predicted to occur;
- **Cumulative and Combined Effects (Landscape and Visual):** there is potential for **significant** adverse cumulative landscape and visual effects with developments in close proximity to the Proposed Development;
- **Cumulative and Combined Effects (Terrestrial Heritage):** There is potential for **significant** adverse cumulative effects associated with the Change to the setting of the Croes Atti Roman Site (FL213) scheduled monument;
- **Cumulative and Combined Effects (Socio-economics, Recreation and Tourism):** there is potential for **significant** beneficial effects associated with net construction employment;
- **Cumulative and Combined Effects (Human Health):** there is potential for **significant** beneficial effects associated with the Employment and Income human health determinant; and
- **Cumulative and Combined Effects (Intra-project effects):** there is potential for the receptors at Residential Properties West end of Kelsterton Road, Kelsterton Farm; and Residential Properties at Kelsterton Lane / Kelsterton Road intersection to experience a new or different environmental effect associated with the combination of adverse visual and noise effects.

10. What happens next?

- 10.1.1 The Applicant has completed the pre-application stage of the DCO process and submitted this ES as part of the DCO application to the Planning Inspectorate on 5 August 2025. The Planning Inspectorate, on behalf of the Secretary of State, will manage the planning process. An inspector, known as the Examining Authority, has been appointed to examine the DCO application. The six-stage process is described in more detail here and illustrated in the image below.
- 10.1.2 The process of 'acceptance' commences once the application has been submitted. There follows a period of 28 days, by the end of which the Planning Inspectorate will decide whether or not the application meets the standards required to be accepted for examination. The DCO Application was accepted on 28 August 2025.
- 10.1.3 The next stage of the process after 'acceptance' is known as the 'pre-examination period', which lasts a minimum of three months. A notice is published saying where the DCO application documents can be viewed. Members of the public can register with the Planning Inspectorate as interested parties, which entitles them to make relevant representations and participate in the examination process. Information on how to register can be found on the Planning Inspectorate's website:
<https://infrastructure.planninginspectorate.gov.uk/application-process/participating-in-the-process/>
- 10.1.4 At the end of the pre-examination phase, a preliminary meeting is held, and all interested parties are invited to attend. At this meeting, the Examining Authority decides on the key issues which will be taken into account during the examination period. Registered interested parties can send written representations to the Examining Authority during this period and can request to speak at public hearings. The examination period commences the day after the preliminary meeting, and lasts up to six months. The preliminary meeting for the DCO Application was held on 13 January 2026 and the examination is ongoing.
- 10.1.5 After the examination period, the Examining Authority has three months to consider the findings from the examination period. The Examining Authority will then provide the Secretary of State with a report including a recommendation on whether the application should be granted.
- 10.1.6 The Secretary of State then has a further three months to decide whether or not to grant the DCO. Once the decision has been made and published, the decision can be challenged in the High Court through a judicial review over a six week period.
- 10.1.7 Granting the DCO would give the Applicant the necessary legal powers to construct, operate (including maintain) and decommission the Proposed Development.



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Abbreviations

Abbreviation	Meaning
AGI	Above Ground Infrastructure
AIL	Abnormal Indivisible Load
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
AQMA	Air Quality Management Areas
BESS	Battery Energy Storage System
CCC	Climate Change Committee
CCGT	Connah's Quay Combined Cycle Gas Turbine
CCP	Carbon Capture Plant
CCR	Climate Change Resilience
CCRA	Climate Change Resilience Assessment
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Usage, and Storage
CDM	Construction (Design & Management) Regulations
CEMP	Construction Environmental Management Plan
CNP	Critical National Priority
CO ₂	Carbon Dioxide
COMAH	Control of Major Accident Hazards
CPAT	Clwyd Powys Archaeological Trust
CQLCP	Connah's Quay Low Carbon Power
CQN	Connah's Quay North
CSAI	Cranfield Soil and Agrifood Institute
CTMP	Construction Traffic Management Plan
CWTP	Construction Worker Travel Plan
DCC	Direct Contact Cooler
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
EMS	Environmental Management System
ES	Environmental Statement
ESO	Energy System Operator
EUNIS	European Nature Information System

Abbreviation	Meaning
FCC	Flintshire County Council
GHG	Greenhouse Gas
GI	Ground Investigations
GTP	Gas Treatment Plant
GVA	Gross Value Added
GW	Gigawatt
HGV	Heavy Goods Vehicle
HRSG	Heat Recovery Steam Generator
ICCI	In-combination Climate Change Impact
ICES	International Council for the Exploration of the Sea
ISO	International Organization for Standardization
LEMP	Landscape and Ecological Management Plan
LGV	Light Goods Vehicle
MA&Ds	Major Accidents and Disasters
MCA	Marine Character Area
MEPE	Mostyn Energy Park Extension
MHW	Mean High Water
MMO	Marine Management Organisation
MPA	Marine Protected Area
MSA	Mineral Safeguard Areas
MW	Megawatts
NCN	National Cycle Network
NCR	National Cycle Route
NGET	National Grid Electricity Transmission
NH ₃	Ammonia
NLCA	National Landscape Character Area
Nox	Nitrogen
NO ₂ ,	Nitrogen Dioxide
NRW	Natural Resources Wales
NSR	Noise Sensitive Receptors
NTS	Non Technical Summary
OHL	Overhead Line
PAD	Protocol for unexpected archaeological discoveries

Abbreviation	Meaning
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PM ₁₀	Particulate Matter 10
PM _{2.5}	Particulate Matter 2.5
PoE	Port of Ellesmere
PRoW	Public Right of Way
RCAHWM	Royal Commission on the Ancient and Historical Monuments of Wales
SAC	Special Area of Conservation
SCR	Selective Catalytic Reduction
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
UK	United Kingdom
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation

