KEADBY 3
CARBON CAPTURE POWER STATION

A collaboration between **SSE Thermal** and **Equinor**

Document Ref: 5.10

Planning Inspectorate Ref: EN010114

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

Land at and in the vicinity of the Keadby Power Station site, Trentside, Keadby, North Lincolnshire

Landscaping and Biodiversity Management and Enhancement Plan

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(q)

Applicant: Keadby Generation Limited

Date: ~~May 2021~~April 2022

DOCUMENT HISTORY

Document Ref	5.10/ Landscaping and Biodiversity Management and Enhancement Plan
Revision	~~VP1~~VP2.0
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GLOSSARY

Abbreviation	Description
AGI	Above Ground Installation - installations used to support the safe and efficient operation of a pipeline; above ground installations are needed at the start and end of a cross-country pipeline and at intervals along the route.
AIL	Abnormal Indivisible Load - a load that cannot be broken down into smaller loads for transport without undue expense or risk of damage. It may also be a load that exceeds certain parameters for weight, length and width.
CCGT	Combined Cycle Gas Turbine - a highly efficient form of energy generation technology. An assembly of heat engines work in tandem using the same source of heat to convert it into mechanical energy which drives electrical generators and consequently generates electricity.
CCUS	Carbon Capture, Usage and Storage - group of technologies designed to reduce the amount of carbon dioxide (CO2) released into the atmosphere from coal and gas power stations as well as heavy industry including cement and steel production. Once captured, the CO2 can be either re-used in various products, such as cement or plastics (utilisation), or stored in geological formations deep underground (storage).
CEMP	Construction Environmental Management Plan - a plan to outline how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area.
CoW	Clerk of Works - a person who oversees building work in progress.
DCO	Development Consent Order - made by the relevant Secretary of State pursuant to The Planning Act 2008 to authorise a Nationally Significant Infrastructure Project. A DCO can incorporate or remove the need for a range of consents which would otherwise be required for a development. A DCO can also include rights of compulsory acquisition.
Defra	Department for Environment, Food and Rural Affairs

Abbreviation	Description
EIA Regulations	Environmental Impact Assessment Regulations 2017
ES	Environmental Statement - a report in which the process and results of an Environment Impact Assessment are documented.
HP	High Pressure
INNS	Invasive Non-native Species - species that have occurred outside of their natural range. Invasive species have the potential to hinder or prevent survival of others within the ecosystem.
ISMP	Invasive Species Management Plan - preventing and managing the spread of invasive species and their potential impacts.
LBAP	Local Biodiversity Action Plan – a strategy to guide biodiversity conservation, communication and education work at a local (usually county) level.~~Local Biodiversity Action Partnership – partnerships that operate at a local authority level and help conserve and enhance biodiversity. The partnerships deliver a wide range of biodiversity conservation, communication and education work in their local areas.~~
LBMEP	Landscape and Biodiversity Management and Enhancement Plan
MW	Megawatt – unit of power.
NEP	The Northern Endurance Partnership - a partnership between bp, Eni, Equinor, National Grid, Shell and Total to develop infrastructure to transport and store CO2 emissions.
NLC	North Lincolnshire Council
NPPF	The National Planning Policy Framework – Policy Framework which first came into effect in March 2012 (with some transitional arrangements) replacing the majority of national planning policy other than NPSs. A revision of the NPPF was published in July 2018 by the Ministry of Housing, Communities and Local Government and updated again in ~~February 2019~~July 2021. The NPPF is part of the Government's reform of the planning system intended to make it less complex, to protect the environment and to promote sustainable growth. It does not contain any specific policies on Nationally Significant Infrastructure Projects, but its policies may be considered in decisions on DCOs if the Secretary of State considers them to be 'relevant'.
NPS	National Policy Statements – statements produced by Government under the Planning Act 2008 providing the policy framework for Nationally Significant Infrastructure Projects. They include the Government's view of the need for and objectives for the development of Nationally Significant Infrastructure Projects in

Abbreviation	Description
	a particular sector such as energy and are used to determine applications for such development.
NSIP	Nationally Significant Infrastructure Projects – defined by the Planning Act 2008 and covers projects relating to energy (including generating stations, electric lines and pipelines); transport (including trunk roads and motorways, airports, harbour facilities, railways and rail freight interchanges); water (dams and reservoirs, and the transfer of water resources); waste water treatment plants and hazardous waste facilities. These projects are only defined as nationally significant if they satisfy a statutory threshold in terms of their scale or effect.
OMH	Open Mosaic Habitats - found mainly in urban and formerly industrial areas and have high biodiversity value.
The Order	The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order
PCC	Power and Carbon Capture
PINS	Planning Inspectorate - executive agency of the Department for Communities and Local Government of the United Kingdom Government. It is responsible for determining final outcomes of town planning.
SoS	Secretary of State - title typically held by Cabinet Ministers in charge of Government Departments.
WCA	Wildlife Countryside Act 1981 (as amended) – legislation for the protection of animals, plants and certain habitats in the UK.
ZCH	Zero Carbon Humber - a consortium of energy and industrial companies and academic institutions with a shared vision to transform the Humber region into the UK's first net-zero carbon cluster by 2040.

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APPENDIX

Revision History for Version VP2.0

Item	Nature of Revision
1	Updates made to the LBMEP considering: a) the notification of a proposed application for material change notified to the Examining Authority at Deadline 2 (**REP2-014**) and related effects on habitats – this includes an updated Arboricultural Impact Assessment, including Tree Survey and Tree Constraints Plan included in **Appendix E**; b) use of Biodiversity Metric Version 3.0 released in July 2021, following acceptance of the DCO Application, to re-evaluate overall biodiversity net gain (including the Proposed Development Changes) and to form the basis for updated biodiversity management and enhancement plans (Figure 4.15 – Rev 02). Please refer to **Appendix D**.

EXECUTIVE SUMMARY

1 This Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) has been prepared on behalf of Keadby Generation Limited (the Applicant) and forms part of the application for development consent for the construction, operation (including maintenance) and decommissioning of a new low carbon gas fired electricity generating station (the Proposed Development). The Proposed Development is predominantly located within the wider Keadby Power Station site, to the west of Keadby 2 Power Station, in North Lincolnshire.

2 The purpose of this document is to set out the measures proposed to mitigate the potential impacts and effects of the Proposed Development on landscape and biodiversity features, and to enhance the biodiversity, landscape and green infrastructure value of the Proposed Development Site. The final LBMEP will be agreed as a Requirement of the draft DCO (**Application Document Ref. 2.1**) **[APP-005]**.

3 The Proposed Development has been designed, as far as is practicable, to avoid or reduce effects on landscape and biodiversity features through careful siting, development design and impact avoidance. These include measures to avoid impacts on protected species to comply with legislation (see **Chapter 11**: Biodiversity and Nature Conservation (ES Volume I - **Application Document Ref. 6.2**)).

4 The ecological impact assessment (**Chapter 11:** Biodiversity and Nature Conservation (ES Volume I - **Application Document Ref. 6.2**) **[APP-054]** including **Chapter 11**: –Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11 Rev 02**) identifies that the careful siting of the Proposed Development to avoid sensitive habitats has minimised potential for sensitive habitats and species to be adversely affected. Consequently, no likely significant ecological effects are predicted. However, the assessment still identifies a need for proportionate embedded ecological mitigation for purposes of good practice and legislative compliance. Habitat re-instatement and enhancement is also required in order to demonstrate no net loss and a net gain of biodiversity in accordance with the requirements of national and local planning policy (currently there is no legal requirement to deliver biodiversity net gain, and currently this is not anticipated for NSIP before 2025).

5 The landscape and visual impact assessment (**Chapter 14**: Landscape and Visual Amenity (ES Volume I - **Application Document Ref. 6.2**) **[APP-057**) including **Chapter 14**: Landscape and Visual Amenity of the ES Addendum (**Document Ref. 6.2.14 Rev 02**) concludes that the Proposed Development will result in significant adverse effects on visual amenity during construction and operation from three of the assessed viewpoints as a result of the close distance to the Proposed Development Site and lack of intervening vegetation:

- Viewpoint 1 (Chapel Lane West, Keadby);

- Viewpoint 2 (Gate Keepers Residence (Vazon Bridge), Keadby); and
- Viewpoint 4 (PRoW (KEAD9, KEAD10) north of Keadby).

6 ~~However, the~~The opportunity for mitigation of the visual effects of the Proposed Development is limited due to the size and scale of the Proposed Development. As shown in the assessment, the effects on visual amenity largely relate to the height of the tallest structures and as such it is considered that the addition of landscape features such as trees and woodland would not be effective in reducing the effects on visual amenity. However, there remains a need for enhancements to the landscape character and improvements to the green infrastructure network, to meet requirements of local and national planning policy.

7 This document outlines the landscape and biodiversity impact avoidance measures that will be implemented prior to, and during, construction of the Proposed Development, as well as the habitat reinstatement, enhancement, management and monitoring measures to be implemented at the end of construction and continuing once the Proposed Development is operational. This would be controlled and implemented through the final Construction Environmental Management Plan (CEMP) that will be developed by the contractor. A Framework CEMP is provided as **Application Doc Ref. 7.1 [**APP-160**]**.

8 The proposed landscape and biodiversity enhancement measures are summarised below. The proposals have been designed to be delivered within the existing land ownership of the Applicant and focus on enhancing the value of existing habitats within the vicinity of the Proposed Development to include:

- enhancement and creation of flower-rich native grassland;
- new species-rich native hedgerow plantings;
- enhancement of field drains for water voles and other aquatic biodiversity;
- enhancement of the Hatfield Waste Drain and the Stainforth and Keadby Canal for aquatic biodiversity; and
- installation of nest boxes for barn owl and other birds, habitat creation for willow tit, and installation of roosting boxes for bats.

~~9 The Natural England Biodiversity Metric 2.0 has been used to quantify the biodiversity value of the habitats to be lost, restored and enhanced to demonstrate that there will be no net loss and that overall, there will be a net gain of biodiversity as a result of the Proposed Development. In the limited instances (as explained in the main text) where it is not been possible to compensate like for like for habitat loss (e.g. loss of scrub) then functionally comparable habitat will be provided (e.g. new hedgerow plantings).~~

~~10~~9 The proposed locations for flower-rich native grassland includes areas directly connected to, and therefore enhancing, two habitat corridors associated with Local Wildlife Sites (LWS), namely Stainforth and Keadby Canal Corridor LWS and Hatfield Waste Drain LWS. They also complement the undesignated former Keadby Ash Tip, another site of biodiversity importance.

1.0 INTRODUCTION

1.1 Overview

1.1.1 This Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) (**Application Document Ref. 5.10**) has been prepared by AECOM on behalf of Keadby Generation Limited ('the Applicant') which is a wholly owned subsidiary of SSE plc. It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy (BEIS), under Section 37 of 'The Planning Act 2008' (the '2008 Act').

1.1.2 The Applicant is seeking development consent for the construction, operation and maintenance of a new low carbon Combined Cycle Gas Turbine (CCGT) Generating Station ('the Proposed Development') on land at, and in the vicinity of, the existing Keadby Power Station, Trentside, Keadby, Scunthorpe DN17 3EF (the 'Proposed Development Site').

1.1.3 The Proposed Development is a new electricity generating station of up to 910 megawatts (MW) gross electrical output, equipped with carbon capture and compression plant and fuelled by natural gas, on land to the west of Keadby 1 Power Station and the (under ~~construction~~commissioning) Keadby 2 Power Station, including connections for cooling water, electrical, gas and utilities, construction laydown areas and other associated development. It is described in **Chapter 4:** The Proposed Development of the Environmental Statement (ES) (ES Volume I - **Application Document Ref. No. 6.2**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 -Rev 02**).

1.1.4 The Proposed Development falls within the definition of a 'Nationally Significant Infrastructure Project' (NSIP) under Section 14(1)(a) and Sections 15(1) and (2) of the 2008 Act, as it is an onshore generating station in England that would have a generating capacity greater than 50MW electrical output (50MWe). As such, a DCO application is required to authorise the Proposed Development in accordance with Section 31 of the 2008 Act.

1.1.5 The DCO, if made by the SoS, would be known as 'The Keadby 3 ~~Low Carbon Gas Fired Generating~~Carbon Capture Power Station Order' (the Order).

~~1.2 The Applicant~~

~~1.2.1 The Applicant, Keadby Generation Limited, is the freehold owner of a large part of the Proposed Development Site and is a wholly owned subsidiary of the FTSE 100-listed SSE plc, one of the UK's largest and broadest-based energy companies, and the country's leading developer of renewable energy generation. Over the last 20 years, SSE plc has invested over £20bn to deliver industry-leading offshore wind, onshore wind, CCGT, energy from waste, biomass, energy networks and gas storage projects. The Applicant owns and operates the adjacent Keadby 1 Power Station and is in the process of constructing Keadby 2 Power Station. SSE operates the Keadby Windfarm~~

which lies to the north and south of the Proposed Development Site and generates renewable energy from 34 turbines, with a total installed generation capacity of 68MW.

1.2.2 SSE has produced a 'Greenprint' document (SSE plc, 2020a) that sets out a clear commitment to investment in low carbon power infrastructure, working with government and other stakeholders to create a net zero power system by 2040. This includes investment in flexible sources of electricity generation and storage for times of low renewable output which will complement other renewable generating sources, using low carbon fuels and/ or capturing and storing carbon emissions. SSE is working with leading organisations across the UK to accelerate the development of carbon capture, usage and storage ('CCUS') clusters, including Equinor and National Grid Carbon.

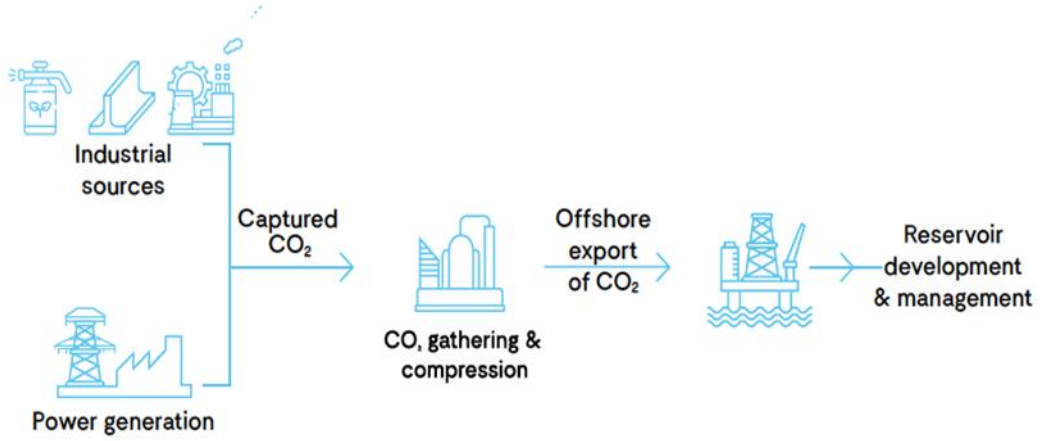
1.2.3 The design of the Proposed Development demonstrates this commitment. The Proposed Development will be built with a clear route to decarbonisation, being equipped with post-combustion carbon capture technology, consistent with SSE's commitment to reduce the carbon intensity of electricity generated by 60% by 2030, compared to 2018 levels (SSE plc, 2020b). It is intended that the Proposed Development will connect to infrastructure that will be delivered by the Zero Carbon Humber (ZCH) Partnership[1] and Northern Endurance Partnership (NEP)[2] for the transport and offshore geological storage of carbon dioxide.

1.3 What is Carbon Capture, Usage and Storage?

1.3.1 CCUS is a process that removes carbon dioxide emissions at source, for example emissions from a power station or industrial installation, and then compresses the carbon dioxide so that it can be safely transported to secure underground geological storage sites. It is then injected into layers of solid rock filled with interconnected pores where the carbon dioxide becomes trapped and locked in place, preventing it from being released into the atmosphere. Plate 1 shows what is involved in the process.

[1] [redacted]

[2] [redacted]



~~Plate 1: Illustration of the Carbon Capture, Usage and Storage~~

~~1.3.2 The technologies used in CCUS are proven and have been used safely across the world for many years. Geological storage sites are located far underground and are subject to stringent tests to ensure that they are geologically suitable. It is expected that the storage sites will be located offshore, in areas such as the North Sea. The NEP has been formed to develop the offshore infrastructure to transport and store carbon dioxide emissions in the North Sea.~~

~~1.3.3 CCUS is crucial to reducing carbon dioxide emissions and combatting global warming. The UK Government has committed to achieving Net Zero in terms of greenhouse gas emissions by 2050. This is a legally binding target. UK Government policy further states that the '*deployment of power CCUS projects will play a key role in the decarbonisation of the electricity system at low cost*' (HM Government, 2020a, page 47).~~

~~1.3.4 The Proposed Development will provide up to 910MWe (gross) of dispatchable capacity and capture some 2 million tonnes of carbon dioxide per annum, dependent upon the turbine equipment chosen and the running hours of the plant. The Proposed Development could be up and running by the mid-2020s and will facilitate the timely development of a major CCUS cluster in the Humber region, making an important contribution towards the achievement of Net Zero by 2050.~~

~~1.4~~1.2 The Proposed Development

~~1.4.1~~1.2.1 The Proposed Development will work by capturing carbon dioxide emissions from the gas-fired power station and connecting into the Humber Low Carbon Pipelines project pipeline network, being promoted by NGCL, for onward transportation to the Endurance storage site under the North Sea ~~ZCH Partnership export pipeline and gathering network for onward transport to the Endurance saline aquifer under the North Sea~~.

~~1.4.2~~1.2.2 The Proposed Development would comprise a low carbon gas fired power station with a gross electrical output capacity of up to 910MWe and associated buildings, structures and plant and other associated development defined in ~~the~~ Schedule 1 of the draft DCO (**Application Document Ref. No. 2.1**) **[APP-005]** as Work No. 1 – 11 and shown on the Works Plans (**Application Document Ref. No. 4.3**) **[APP-012]**.

~~1.4.3~~1.2.3 At this stage, the final technology selection cannot yet be made as it will be determined by various technical and economic considerations and will be influenced by future UK Government policy and regulation. 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, regulatory and market conditions once a DCO is made.

~~1.4.4~~1.2.4 The Proposed Development will include:

- a carbon capture equipped electricity generating station including a CCGT plant (**Work No. 1A**) with integrated cooling infrastructure (**Work No. 1B**), and carbon dioxide capture plant (CCP) including conditioning and compression equipment, carbon dioxide absorption unit(s) and stack(s) (**Work No. 1C**), natural gas receiving facility (**Work No. 1D**), supporting uses including control room, workshops, stores, raw and demineralised water tanks and permanent laydown area (**Work No. 1E**), and associated utilities, various pipework, water treatment plant, wastewater treatment, firefighting equipment, emergency diesel generator, gatehouse, chemical storage facilities, other minor infrastructure and auxiliaries/ services (all located in the area referred to as the 'Proposed Power and Carbon Capture (PCC) Site' and which together form **Work No. 1**);
- natural gas pipeline from the existing National Grid Gas high pressure (HP) gas pipeline within the Proposed Development Site to supply the Proposed Power and Carbon Capture (PCC) Site including an above ground installation (AGI) for National Grid Gas's apparatus (**Work No. 2A**) and the Applicant's apparatus (**Work No. 2B**) (the 'Gas Connection Corridor');
- electrical connection works to and from the existing National Grid (National Grid Electricity Transmission) 400kV Substation for the export of electricity (**Work No. 3A**) (the 'Electrical Connection Area to National Grid 400kV Substation');
- electrical connection works to and from the existing Northern Powergrid 132kV Substation for the supply of electricity at up to 132kV to the Proposed PCC Site, and associated plant and equipment (**Work No. 3B**) (the 'Potential Electrical Connection to Northern Powergrid 132kV Substation');
- Water Connection Corridors to provide cooling and make-up water including:
  - underground and/ or overground water supply pipeline(s) and intake structures within the Stainforth and Keadby Canal, including temporary cofferdam (**Work No. 4A**) (the 'Canal Water Abstraction Option');

- in the event that the ~~c~~Canal Water ~~a~~Abstraction ~~o~~Option is not available, works to the existing Keadby 1 power station cooling water supply pipelines and intake structures within the River Trent, including temporary cofferdam (**Work No. 4B**) (the 'River Water Abstraction Option'); and
- works to and use of an existing outfall and associated pipework for the discharge of return cooling water and treated wastewater to the River Trent (**Work No. 5**) (the 'Water Discharge Corridor');

- towns water connection pipeline from existing water supply within the Keadby Power Station to provide potable water (**Work No. 6**);
- above ground carbon dioxide compression and export infrastructure comprising an above ground installation (AGI) for the undertaker's apparatus including deoxygenation, dehydration, staged compression facilities, outlet metering, and electrical connection (**Work No. 7A**) and an above ground installation (AGI) for National Grid Carbon's apparatus (**Work No. 7B**);
- new permanent access from the A18, comprising the maintenance and improvement of an existing private access road from the junction with the A18 including the western private bridge crossing of the Hatfield Waste Drain (**Work No. 8A**) and installation of a layby and gatehouse (**Work No. 8B**), and an emergency vehicle and pedestrian access road comprising the maintenance and improvement of an existing private track running between the Proposed PCC Site and Chapel Lane, Keadby and including new private bridge (**Work No. 8C**);
- temporary construction and laydown areas including contractor facilities and parking (**Work No. 9A**), and access to these using the existing private roads from the A18 and the existing private bridge crossings, including the replacement of the western existing private bridge crossing known as 'Mabey Bridge') over Hatfield Waste Drain (**Work No. 9B**) and a temporary construction laydown area associated with that bridge replacement (**Work No. 9C**);
- temporary retention, improvement and subsequent removal of an existing and extended Additional Abnormal Indivisible Load Haulage Route (**Work No. 10A**) and temporary use, maintenance, and placement of mobile crane(s) at the existing Railway Wharf jetty for a Waterborne Transport Offloading Area (**Work No. 10B**) and inclusion of land within the River Trent (**Work No. 10C**) which will be required for the mooring of vessels at the Waterborne Transport Offloading Area;
- landscaping and biodiversity enhancement measures (**Work No. 11A**) and security fencing and boundary treatments (**Work No. 11B**); and
- minor associated development ~~including: surface water drainage systems; pipeline and cable connections between parts of the Proposed Development Site; hard standings and hard landscaping; soft landscaping, including bunds and embankments; external lighting, including lighting~~

~~columns; gatehouses and weighbridges; closed circuit television cameras and columns and other security measures; site preparation works including clearance, demolition, earthworks, works to protect buildings and land, and utility connections; accesses, roads, roadways and vehicle and cycle parking; pedestrian and cycle routes; and temporary works associated with the maintenance of the authorised development~~.

~~1.4.5 The Applicant will be responsible for the construction, operation (including maintenance) and eventual decommissioning of the Proposed Development, with the exception of the National Grid Gas compound works (**Work No. 2A**), the works within the National Grid Electricity Transmission 400kV substation (part of **Work No. 3A**), the works within the Northern Powergrid 132kV substation (part of **Work No. 3B**), and the National Grid Carbon compound works (**Work No. 7B**), which will be the responsibility of those named beneficiaries.~~

~~1.4.6~~1.2.5 The Proposed Development includes the equipment required for the capture and compression of carbon dioxide emissions from the generating station so that it is capable of being transported off-site. NGCL will be responsible for the development of the carbon dioxide pipeline network linking onshore power and industrial facilities, including the Proposed Development, in the Humber Region. The carbon dioxide export pipeline does not, therefore, form part of the Proposed Development and is not included in the Application but will be the subject of separate consent application(s) to be taken forward by NGCL~~The Proposed Development includes the equipment required for the capture and compression of carbon dioxide emissions from the generating station so that it is capable of being transported off-site. ZCH Partnership will be responsible for the construction, operation and decommissioning of the carbon dioxide gathering network linking onshore power and industrial facilities including the Proposed Development in the Humber Region. The carbon dioxide export pipeline does not, therefore, form part of the Proposed Development and is not included in the Application but will be the subject of separate consent applications by third parties, such as the Humber Low Carbon Pipeline DCO Project by National Grid Carbon~~.

~~1.4.7~~1.2.6 The Proposed Development will operate 24 hours per day, 7 days per week with programmed offline periods for maintenance. It is anticipated that in the event of CCP maintenance outages, for example, it will be necessary to operate the Proposed Development without carbon capture, with exhaust gases from the CCGT being routed via the Heat Recovery Steam Generator (HRSG) stack.

~~1.4.8~~1.2.7 Various types of associated and ancillary development further required in connection with and subsidiary to the above works are detailed in Schedule 1 'Authorised Development' of the draft DCO (**Application Document Ref. 2.1**). This along with **Chapter 4:** The Proposed Development in the ES Volume I (**Application Document Ref. 6.2**) provides further description of the Proposed Development. The areas within which each numbered Work (component) of

the Proposed Development are to be built are defined by the coloured and hatched areas on the Works Plans (**Application Document Ref. 4.3**).

~~1.5~~1.3 The Proposed Development Site

~~1.5.1~~1.3.1 The Proposed Development Site (the 'Order Limits') is located within and near to the existing Keadby Power Station site near Scunthorpe, Lincolnshire and lies within the administrative boundary of North Lincolnshire Council (NLC). The majority of land is within the ownership or control of the Applicant (or SSE associated companies) and is centred on national grid reference 482351, 411796.

~~1.5.2~~1.3.2 The existing Keadby Power Station site currently encompasses the operational Keadby 1 and (under construction) Keadby 2 Power Station sites, including the Keadby 2 Power Station Carbon Capture and Readiness reserve space.

~~1.5.3~~1.3.3 The Proposed Development Site encompasses an area of approximately 69.4 hectares (ha). This includes an area of approximately 18.7ha to the west of Keadby 2 Power Station in which the generating station (CCGT plant, cooling infrastructure and CCP) and gas connection will be developed (the Proposed PCC Site).

~~1.5.4~~1.3.4 The Proposed Development Site includes other areas including:

- a high pressure gas pipeline to supply the CCGT including a gas compound for NGG apparatus and a gas compound for the Applicant's apparatus~~Previously developed land, along with gas, towns water and other connections, and access routes, within the Keadby Power Station site~~;
- the National Grid 400kV Substation located directly adjacent to the Proposed PCC Site, through which electricity generated by the Proposed Development will be exported;
- Emergency Vehicle Access Road and Potential Electrical Connection to Northern Powergrid Substation~~, the routes of which utilise an existing farm access track towards Chapel Lane and land within the existing Northern Powergrid substation on Chapel Lane~~;
- Water Connection Corridors:
  - Canal Water Abstraction Option which includes land within the existing Keadby Power Station site with an intake adjacent to the Keadby 2 Power Station intake and pumping station and interconnecting pipework;
  - River Water Abstraction Option which includes a corridor that spans Trent Road and encompasses the existing Keadby Power Station pumping station, below ground cooling water pipework, and infrastructure within the River Trent; and
  - a Water Discharge Corridor which includes an existing discharge pipeline and outfall to the River Trent and follows a route of an existing easement for Keadby 1 Power Station;

- an existing river wharf at Railway Wharf (the Waterborne Transport Offloading Area) and existing temporary haul road into the into the existing Keadby 1 Power Station Site and extended to the north of Keadby 1 Power Station Site (the 'Additional Abnormal Indivisible Load (AIL) Route');
- a number of temporary Construction Laydown Areas on previously developed land and adjoining agricultural land; and
- land at the A18 Junction and an existing site access road, including two existing private bridge crossings of the Hatfield Waste Drain lying west of Pilfrey Farm (the western of which is known as Mabey Bridge, to be replaced, and the eastern of which is termed Skew Bridge) and an existing temporary gatehouse, to be replaced in permanent form.

~~1.5.5~~1.3.5 In the vicinity of the Proposed Development Site the River Trent is tidal, therefore parts of the Proposed Development Site are within the UK marine area. No harbour works are proposed.

~~1.5.6~~1.3.6 Further description of the Proposed Development Site and its surroundings is provided in **Chapter 3:** The Site and Surrounding Area in ES Volume I (**Application Document Ref. 6.2**).

~~1.6~~1.4 The Development Consent Process

~~1.6.1~~1.4.1 As a NSIP project, the Applicant is required to obtain a DCO to construct, operate and maintain the generating station, under Section 31 of the 2008 Act. Sections 42 to 48 of the 2008 Act govern the consultation that the promoter must carry out before submitting an application for a DCO and Section 37 of the 2008 Act governs the form, content and accompanying documents that are required as part of a DCO application. ~~These requirements are implemented through the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ('APFP Regulations') which state that an application must be accompanied by an ES, where a development is considered to be 'EIA development' under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations).~~

~~1.6.2~~1.4.2 An application for development consent for the Proposed Development has been submitted to the Planning Inspectorate (PINS) acting on behalf of the ~~Secretary of State~~SoS. Subject to the Application being accepted (which will be decided within a period of 28 days following receipt of the Application), PINS will then examine it and make a recommendation to the ~~Secretary of State~~SoS, who will then decide whether to make (grant) the DCO.

~~1.7~~1.5 The Purpose of this Document

~~1.7.1~~1.5.1 The purpose of this document is to set out the measures proposed to avoid and mitigate the effects of the Proposed Development on landscape and biodiversity features, ~~and~~to provide a net gain for ~~to enhance the~~ biodiversity, and to enhance landscape and green infrastructure value of the Site, to secure compliance with relevant national and local planning policies. This

~~document~~LBMEP therefore complements, and provides the outline specifications for realising, the Biodiversity Net Gain (BNG) assessment presented for the Proposed Development in **Appendix D**.

~~1.7.2~~1.5.2 In order to avoid potential conflicts in approach to impact avoidance and enhancement, this document identifies the measures required for both landscape and biodiversity together, to demonstrate a cohesive strategy.

~~1.7.3~~1.5.3 The document is structured as follows:

- Section 2 summarises relevant legislation and planning policy;
- Section 3 describes the existing landscape and biodiversity features and the potential impacts and effects of the Proposed Development;
- Section 4 outlines the requirements for impact avoidance, both during advance works and during the construction phase;
- Section 5 describes the proposals for landscape and biodiversity enhancement and the measures required for their effective management and maintenance. The areas of the Proposed Development Site to which the different proposals will be applied are illustrated in **Figure 1**;
- Section 6 describes the high-level approach to monitoring of the success of the proposed landscape and biodiversity habitat interventions; and
- Section 7 describes the roles and responsibilities of all parties involved in the delivery of the management and enhancement proposals.

2.0 LEGISLATION AND PLANNING POLICY

2.1 Overview

2.1.1 The legislation and the planning policy relevant to construction of the Proposed Development and the specification of landscape and biodiversity mitigation and enhancement is listed in this section. This legislation and planning policy have been considered when formulating this Plan. **Appendix 11A:** Biodiversity and Nature Conservation Legislation and Planning Policy (ES Volume II – **Application Document Ref. 6.3**) **[APP-076]** provides more details on this relevant legislation and planning policy for biodiversity.

2.2 Legislation

2.2.1 The following legislation has been considered in the preparation of this Plan:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Wildlife and Countryside Act (WCA) 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992;
- Wild Mammals (Protection) Act 1996;
- Environmental Protection Act 1990; and
- Invasive Alien Species (Enforcement and Permitting) Order 2019.

2.3 Planning Policy

2.3.1 Relevant national planning policy that has been considered in relation to landscape and biodiversity impact avoidance, mitigation and enhancement is as follows:

- Overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change (DECC), 2011a);
- NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b);
- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), ~~2019~~2021); and
- European Landscape Convention (Council of Europe, 2000).

2.3.2 The local planning policies that are relevant to the Proposed Development Site are set out in the following documents:

- North Lincolnshire Local Plan Saved Policy LC5: Species Protection (NLC, 2003a);

- North Lincolnshire Local Plan Saved Policy LC6: Habitat Creation (NLC, 2003a);
- North Lincolnshire Local Plan Saved Policy LC12: Protection of Trees, Woodland and Hedgerows (NLC, 2003a);
- Emerging North Lincolnshire New Local Plan Policy DQE3p: Biodiversity and Geodiversity (NLC, 2020); and
- Emerging North Lincolnshire New Local Plan Policy DQE8p: Climate Change and Low Carbon Living (NLC, 2020).

2.4 Other Guidance

2.4.1 Other guidance that is relevant context includes:

- North Lincolnshire Supplementary Planning Guidance 3: Design in the Countryside (NLC, 2003b);
- Natural England, Forestry Commission and Department for Environment, Food and Rural Affairs (Defra) Standing Advice on protected sites and species (gov.uk);
- The National Pollinator Strategy (Defra, 2014);
- Local Biodiversity Action Plan (LBAP) for Lincolnshire (Lincolnshire Biodiversity Partnership, 2011);
- Humberhead Levels National Character Area (NCA Profile 39) (Natural England, 2014); and
- North Lincolnshire Landscape Character Assessment and Guidelines (Trent Levels Landscape Character Area and Flat Drained Farmland Landscape Character Type) (NLC, 1999).

3.0 EXISTING LANDSCAPE AND BIODIVERSITY FEATURES AND DEVELOPMENT IMPACTS

~~**3.1 Existing Landscape and Biodiversity Features**~~

~~3.2~~3.1 Habitats

3.1.1 The habitats of relevance to this Plan are described in **Appendix 11C**: Preliminary Ecological Appraisal Report (ES Volume II – **Application Document Ref. 6.3**) [**APP-078**] including in **Appendix 11C:** Preliminary Ecological Appraisal Report of the ES Addendum (**Document Ref 6.2.11 Rev 02**).

3.1.2 The permanent and temporary habitat impacts associated with the Proposed Development have been quantified for the purposes of BNG assessment (see **Appendix D**). These are the relevant habitat impacts of relevant to this document and are addressed by the habitat specifications detailed herein.

~~3.2.1~~

~~3.2.2~~3.1.3 The habitats that would be affected by permanent or temporary land-take comprise:

- 'modified grasslands' encompassing species-poor improved and semi-improved neutral grasslands (located at the Proposed PCC Site and the Highway Improvements on the A18);
- other neutral grassland that is unmanaged and heavily invaded by brambles (located along the ~~Alternative~~Additional AIL Route to the north of Keadby 1 Power Station);
- dense scrub comprising stands of mixed scrub and hawthorn or bramble dominated scrub (located respectively on the boundary of the Proposed PCC Site with the former Keadby Ash Tip, in the wayleave of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation), and the ~~Alternative~~Additional AIL Route to the north of Keadby 2 Power Station~~and hawthorn dominated scrub (located respectively on the boundary of the Proposed PCC Site with the former Keadby Ash Tip, and in the wayleave of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation~~);
- young semi-mature plantation woodland (located along the ~~Alternative~~Additional AIL Route adjacent to Trent Road and Chapel Lane);
- ephemeral/ short perennial vegetation contributing to open mosaic habitats (OMH) (located on the south-west corner of the Proposed PCC Site where there is a minor overlap with the margin of the former Keadby Ash Tip);
- intensively managed arable farmland (located within areas proposed for temporary construction laydown);

- unvegetated disturbed bare ground (located within the temporary soil storage compound for Keadby 2 Power Station, part of the Proposed PCC Site);
- a minor field ditch (Drain 4 located within Proposed PCC Site);
- watercourses comprising the Hatfield Waste Drain (which is crossed by the existing Mabey Bridge which is to be replaced), and the Stainforth and Keadby Canal (within which the ~~potential~~ Canal Water Abstraction Option would be constructed);~~minor field drains (encompassing the unnamed drain located within Proposed PCC Site that will be lost (Drain 4), and other drains on the alignment of Emergency Vehicle Access Road and potential 132kV electrical connection to Northern Powergrid Substation);~~
- ~~watercourses comprising the Hatfield Waste Drain (which is crossed by the existing Mabey Bridge which is to be replaced), the Stainforth and Keadby Canal (within which the potential Canal Water Abstraction Option would be constructed) or the River Trent (within which the potential River Water Abstraction Option would be constructed)~~. And
- existing area of hardstanding and other sealed surfaces (located at the Proposed PCC Site with land formerly used as laydown and car parking during construction of Keadby 2 Power Station).

~~3.2.3~~3.1.4 Additional areas of land to be utilised solely for purposes of landscape and biodiversity enhancement are shown on **Figure 1** of this LBMEP. The existing habitats within these landscape and biodiversity enhancement areas (as mapped and described in **Appendix 11C**, ES Volume II - **Application Document Ref. 6.3**) including **Appendix 11C** of the ES Addendum (**Document Ref 6.2.11- Rev 02)** are:

- 'modified grasslands' of species-poor improved types (located on road verges or in small fields adjacent to the permanent access road off the A18, also includes retained vegetation within the Proposed PCC Site on the alignment of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation);
- other neutral grassland that is unmanaged and heavily invaded by brambles (located to either side of the ~~Alternative~~Additional AIL Route to the north of Keadby 1 Power Station);
- existing tarmac car park (sealed surface) to be broken out and replaced (located adjacent to the permanent access road off the A18); and
- minor field drains (located on the boundaries of the Proposed PCC Site).

~~3.3~~3.2 Protected/ Notable Species

3.2.1 Given the limited impacts on habitats, construction and operation of the Proposed Development also has limited potential, in the absence of mitigation, to adversely affect protected and notable species through direct impacts (killing/ injury), disturbance and habitat loss.

~~3.3.1~~3.2.2 The protected species of relevance to this Plan, because of their presence in the potential zone of influence of construction activities, are:

- badger;
- water vole;
- otter (not recorded during baseline surveys but with potential to establish before construction);
- bats (but not bat roosts, although two unused bat boxes need to be relocated from trees on the alignment of the ~~Alternative~~Additional AIL Route);
- nesting birds (including ground nesting species); and
- fish.

~~3.3.2~~3.2.3 In addition, drains associated with the Proposed Development Site support the following invasive non-native flora and fauna:

- zebra mussel;
- demon shrimp;
- Nuttall's waterweed; and
- New Zealand pigmyweed.

~~**3.4 Impacts on Landscape and Biodiversity Features**~~

~~3.4.1 Table 1 summarises the permanent losses of habitats during construction of the Proposed Development. These are the habitat losses relevant to quantification of the balance of habitat loss to gain (see Section 5.3 and **Appendix D**).~~

Table 1: Permanent Losses of Semi-natural Habitats

Affected habitat	Construction activity	Habitat loss (ha)
Modified grassland (encompassing all species-poor grasslands)	Site clearance for construction of Proposed PCC Site	10.12ha
	A18 Junction Improvement	0.24ha
	Mabey Bridge replacement	0.30ha
Unvegetated disturbed ground (unsealed land currently within Keadby 2 construction site)	Site clearance for construction of Proposed PCC Site	4.58ha
Mixed scrub	Site clearance for construction of Proposed PCC Site	0.08ha
Hawthorn scrub	Site clearance for construction of Proposed PCC Site	0.01ha
OMH	Site clearance for construction of Proposed PCC Site	0.25ha
Species-poor drain	Infilling of minor drain (Drain 4) bisecting Keadby Common during site clearance for Proposed PCC Site. Construction of bridge for Emergency Vehicle Access Road over Glew Drain.	0.04ha
Total		15.62ha

There would also be minor/ very small-scale temporary disturbance impacts on semi-natural habitats and arable farmland, including deferral of pre-existing commitments of the Applicant for reinstatement of habitats affected during construction of Keadby 2 Power Station. Not all of these impacts may occur, as some options will not be required at the time of final design when there has been a final decision on the routes for the 132kV

Electrical Connection to the Northern Powergrid Substation and the location of the proposed cooling water intake.

The temporary impacts are:

deferral of reinstatement of the agricultural land and associated boundary hedgerows and drains on the alignment of the existing temporary construction haul road currently in use for construction of Keadby 2 Power Station;

deferral of habitat reinstatement for the Keadby 2 Power Station (if required based on measures agreed for Keadby 2 Power Station) at the location of the potential Canal Water Abstraction Option on the Stainforth and Keadby Canal due to the potential requirement for additional construction works for the Proposed Development;

use of intensively managed arable farmland for temporary construction laydown; and

possible small-scale disturbance of species-poor road verges and flood bank grasslands, e.g. for vehicle access, Mabey Bridge Replacement and short duration laydown of materials, during A18 Junction Improvement and installation of an eel screen on the potential River Water Abstraction Option (if required).

Given the limited impacts on habitats, construction and operation of the Proposed Development also has limited potential, in the absence of mitigation, to adversely affect protected and notable species through direct impacts (killing/ injury), disturbance and habitat loss. The species requiring mitigation are those identified above in Section 3.1

4.0 IMPACT AVOIDANCE REQUIREMENTS

4.1 Overview

4.1.1 The care that has been taken when configuring the layout of the Proposed Development maintains the functionality of existing green infrastructure networks, wildlife networks and habitat linkages. Further information in relation to this is provided in ~~the~~**Appendix D**. The Proposed Development therefore complies fully with the related requirements of planning policy, ~~and even more so~~especially once the additional proposed habitat reinstatement and enhancement measures are also considered (see Section 5).

4.1.2 The impact avoidance measures outlined below (Section 4.2 onwards) will be implemented, as relevant and appropriate, prior to and during the construction phase, the purpose being to minimise the impact of works on landscape and biodiversity features.

4.1.3 These measures will be applied in order to meet legislative and planning policy requirements for protected species, or as part of standard construction environmental best practice.

4.1.4 The commitment to provide these measures has been considered when assessing the likely impacts and effects of the Proposed Development on landscape and biodiversity features in **Chapter 11**: Biodiversity and Nature Conservation [**APP-054**] including **Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11-Rev 02**) and **Chapter 14:** Landscape and Visual Amenity (ES Volume I - **Application Document Ref. 6.2**) [**APP-057**) including **Chapter 14**: Landscape and Visual Amenity of the ES Addendum (**Document Ref. 6.2.14-Rev 02**).

4.1.5 Avoidance and mitigation of potential impacts on the environment through, for example, noise, vibration or emissions to air or water associated with the operational Proposed Development are not covered within this Plan. While such impacts could affect biodiversity, these effects have been appropriately controlled and mitigated through the design and impact avoidance measures presented in **Chapter 8**: Air Quality [**APP-051**] and **Chapter 9**: Noise and Vibration [**APP-052**] of Environmental Statement (ES) Volume I (**Application Document Ref. 6.2**). In addition, there are other permitting, good practice, legislative, policy and regulatory mechanisms that necessitate the control and prevention of such impacts. The relevant measures are therefore prescribed in other chapters of the ES and do not need to be included within this Plan.

4.2 Protected and Invasive Species Update Surveys

4.2.1 Appropriately experienced ecologists will complete site walkovers in advance of mobilisation or other potential advance works to re-confirm the ecological baseline conditions and identify any new ecological risks. Updated species surveys will also be undertaken to determine the status of protected and invasive non-native species (INNS) identified as present or potentially present

at the Proposed Development Site to inform mitigation requirements and support protected species licence applications. These updated surveys will be completed sufficiently far in advance of construction works to account for seasonality constraints and to allow time for the implementation of any necessary mitigation prior to construction.

4.2.2 Existing or potential landscape and biodiversity constraints that will be re-assessed during update surveys are as follows:

- bats – update roost surveys of trees adjacent to the Proposed Development Site, including re-inspection of existing unused bat boxes by a licensed ecologist prior to their relocation (under licence if needed) to suitable new trees by Trent Road;
- breeding birds – nest checks of vegetation to be cleared, where necessary;
- otter – updated survey for signs of presence;
- water vole – updated survey to determine current distribution and population size;
- badger – updated survey to determine current distribution and activity of badger setts; and
- INNS – updated survey to re-confirm the locations of species that may be disturbed during construction.

4.2.3 Should any new protected or invasive species constraints be identified as a result of the updated surveys, the LBMEP would be updated to address these constraints. Any requirement for additional impact avoidance or mitigation will be discussed and agreed with NLC and/ or the relevant statutory consultees, except where this will otherwise be addressed through the process for obtaining any necessary protected species licences.

4.2.4 Any additional surveys will be instructed during the advance works, site clearance and construction phases as identified as necessary by the ecologist, or otherwise as identified and requested by the Applicant or their contractor(s) when implementing the final approved Construction Environmental Management Plan (CEMP) and other relevant approved plans and permits. These may be required, for example, based on the construction programme, working requirements or following identification of specific issues and constraints not covered by previous advice.

4.3 Protected Species Licences

4.3.1 All necessary protected species licences will be applied for and obtained prior to undertaking any works likely to affect the conservation status of these species, as required by the relevant legislation. Based on the findings of **Chapter 11**: Biodiversity and Nature Conservation (ES Volume I - **Application Document Ref. 6.2**) [**APP-054**] including **Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11-Rev 02**) and

pending the findings of the proposed updated protected species surveys, the following protected species licences may be required:

- badger licence - if direct and indirect disturbance impacts on badger setts are likely and unavoidable (although currently this is not anticipated as likely);
- bat licence – if the two existing unused bat boxes to be relocated for the ~~Alternative~~Additional AIL Route are later found to be occupied by bats then a licence would be needed to relocate these roosts; and
- water vole licence – if water voles are still present at the time of construction and need to be displaced or relocated from construction working areas.

4.3.2 Habitat compensation/ restoration and enhancement will also be required if a protected species licence is needed. Outline proposals for habitat restoration and enhancement in relation to water vole are included within Section 5 of this LBMEP. It is premature and unnecessary to define similar measures for badger at this time, given this is a highly mobile species. Instead, it is noted that the Applicant has sufficient land within their control to meet any such requirements, including land within the former Keadby Ash Tip.

4.3.3 Should licences be required, it is recognised that this could (a) impose restrictions on the timing of construction activities and (b) dictate lead-in times for agreement and completion of pre-construction mitigation. This will therefore be addressed in the final construction programme based on the findings of the updated surveys.

4.4 Clerk of Works

4.4.1 The Applicant will agree when a Clerk of Works (CoW) should be present during construction in consultation with the ecologist and landscape architect based on relevant environmental commitments, the findings of the updated surveys, the requirements of protected species, and with reference to the relevant project programmes.

4.4.2 Immediately prior to site clearance and the start of construction in each relevant part of the Proposed Development Site, further site walkover surveys will be undertaken by an appropriately experienced CoW to confirm that the risks associated with the Proposed Development Site remain as previously assessed and/ or to confirm the correct implementation of impact avoidance measures (e.g. tree protection fencing, protected species stand-offs and other protection measures).

4.4.3 The scope of the required walkover surveys will be defined on a case by case basis, in consultation with the project team, and NLC or other statutory consultees as necessary, based on the specific risks associated with each relevant part of the Proposed Development and the findings of any preceding updated surveys as detailed above in Section 4.2. This will be controlled and

implemented through the final CEMP that will be developed by the contractor. A Framework CEMP is provided as **Application Doc Ref. 7.1** [APP-160].

4.4.4 Relevant site staff will receive toolbox talks from the CoW as necessary on the relevant ecological risks present, legal requirements, working requirements necessary to comply with this legislation, and the final approved landscaping and biodiversity management and enhancement measures. Toolbox talks will be repeated as necessary over the duration of the construction works.

4.5 Tree Works

4.5.1 A~~n~~ full arboricultural survey of the Proposed Development Site, in line with BS5837:2012 will be undertaken concurrently with the detailed design, to identify where any trees are likely to be affected by the construction works and to inform the development of the detailed design and specification of tree root protection zones.

4.5.2 Where works in close proximity to retained trees cannot be practicably avoided, these works will be undertaken in accordance with current best practice. At the time of issue of this LBMEP, current best practice is defined in:

- British Standard (BS) 5837: 2012 Trees in relation to design, demolition and construction – Recommendations (British Standards Institute, 2012); and
- National Joint Utilities Group (NJUG) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (NJUG, 2007).

4.5.3 Necessary protective fencing will be installed as required and prior to the commencement of site clearance or construction works in proximity to trees, as will be set out in the Arboricultural Report to be produced following the detailed pre-construction tree surveys and to be detailed as part of the Arboricultural Method Statement.

~~4.5.3~~4.5.4 To address trees affected by the Proposed Design Changes associated with land within the Additional AIL Route, as set out in the ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7-Rev 02**), an Arboricultural Impact Assessment has been produced (see **Appendix E**).

4.6 Built Structures

4.6.1 The following impact avoidance measures in relation to built structures are highlighted as part of the landscape and visual amenity assessment (**Chapter 10**: Landscape and Visual Amenity (ES Volume I - **Application Document Ref. 6.2**) [APP-057] and will be taken into consideration as part of the detailed design of the Proposed Development. Implementation of these measures is secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**) [APP-005]:

- suitable materials will be used, where reasonably practicable, in the construction of structures to reduce reflections and to assist with breaking up the massing of the buildings and structures;
- the selection of finishes for the buildings and other infrastructure will be informed by the finishes of the adjacent developments including Keadby 2 Power Station, in order to reduce the visual impact of the Proposed Development including using lighter coloured materials on the taller structures to enable them to recede against the sky. Finishes and materials will be agreed with relevant consultees and approved by NLC at the detailed design stage, secured through a Requirement of the draft DCO, in order to minimise the visual impact of the Proposed Development;
- lighting required during the construction and operation stages of the Proposed Development will be designed to reduce unnecessary light spill outside of the Proposed Development Site boundary, in accordance with the Indicative Lighting Strategy (**Application Document Ref. 5.11**) **[APP-040]**; and
- where existing vegetation is present along the Proposed Development Site boundary, this will be retained, as far as reasonably practicable, and managed to support its continued presence to aid the screening of low level views into the Proposed Development Site.

4.7 Precautionary Working Methods

4.7.1 The following precautionary working methods will be employed to minimise potential adverse effects on protected/ notable species prior to and during construction. Precautionary working method statements will be produced as necessary to specify working requirements and other necessary impact avoidance measures. These measures would be controlled and implemented through the final CEMP) that will be developed by the contractor. The CEMP is secured by a Requirement of the draft DCO **(Application Document Ref. 2.1**) **[APP-005]**. A Framework CEMP is provided as **Application Doc Ref. 7.1 [APP-160]**.

4.7.2 The measures set out below for individual species will be implemented in a manner that avoids conflicts with requirements for other relevant species that may occupy the same habitats. As an example, nesting bird mitigation will be implemented in a manner that is consistent with the mitigation required for water vole.

4.7.3 An appropriately qualified CoW will review and advise on the requirements for precautionary working methods to be implemented within each part of the Proposed Development Site and will supervise implementation of the required measures.

Water Vole

4.7.4 An appropriate Water Vole Impact Avoidance Strategy will be prepared with reference to updated survey data and agreed with relevant stakeholders. It will set out all of the measures and supervision required to deliver legislative compliance during construction of the Proposed PCC Site and watercourse crossings. Prior submission and approval of the Water Vole Impact Avoidance Strategy is a commitment of the Framework CEMP provided as **Application Doc Ref. 7.1 [APP-160]**.

4.7.5 The Water Vole Impact Avoidance Strategy will address (as relevant):

- loss of the sub-optimal habitat associated with the drain crossing Keadby Common, where one water vole territory was identified based on surveys in May and August 2020;
- minor works on Glew Drain at the location of the proposed bridge crossing for the Emergency Vehicle Access Road, where localised evidence of water vole was found in May and August 2020;
- replacement of Mabey Bridge at the site access off the A18 (no evidence of water vole found during baseline surveys); and
- minor works for installation of the potential 132kV electrical connection to Northern Powergrid Substation) required over Glew Drain and Keadby Common Drain, where water vole has been recorded.

4.7.6 The Water Vole Impact Avoidance Strategy will include:

- the latest updated survey data for relevant field drains;
- requirements for ongoing further surveys, ongoing monitoring and attendance by an appropriately experienced CoW;
- appropriate construction stand-offs from watercourses that will be maintained at all times (retained watercourses) or, in the case of watercourse crossings, until such time that the CoW advises that the relevant construction works can proceed;
- options for micro-siting to avoid water vole and its burrows;
- appropriate timings to minimise potential for disturbance impacts on water vole;
- requirements for habitat mitigation and enhancement to accommodate any water voles displaced as a result of land take for the Proposed Development;
- requirements (if relevant) for displacement, trapping, exclusion and relocation of water voles from relevant construction areas (although based on current data confirming only a very small and localised water vole presence on relevant drains, the adjacent retained and enhanced areas of

drain habitat are anticipated to be sufficient to accommodate any water voles displaced);

- site inductions and toolbox talks as appropriate; and
- any protected species licence needed to permit the relevant construction works to proceed. If a licence is required, then enhancement proposals for water vole are likely to be needed to secure this licence. Proposals for water vole enhancement are already allowed for and outlined within this LBMEP, which will also benefit other freshwater biodiversity.

Bats

4.7.7 There are two bat boxes that need to be relocated before a semi-mature ash tree is felled for construction of the ~~Alternative~~Additional AIL Route. These boxes were installed for Keadby 2 Power Station and annual monitoring surveys indicate that bats have not used these boxes, so currently there are no bat roosts present. The actions to be taken going forward are:

- A licensed bat ecologist will inspect the boxes prior to any disturbance to determine if bat roosts are present. If roosts are detected, then a licence would be obtained prior to implementing the following steps;
- Bat boxes to be removed from the relevant ash tree before it is felled, and relocated to a suitable tree nearby adjacent to Trent Road; and
- If one or both bat boxes is not in a suitable state to be relocated, then they will be replaced with new bat boxes constructed from a durable material e.g. woodcrete.

Nesting Birds

~~4.7.7~~4.7.8 The following approach would be taken to deliver legislative compliance in relation to nesting birds:

- relevant grassland areas will be mown short (<5cm) prior to commencement of the breeding season (typically March-August inclusive for most species), and then mown weekly to maintain this short sward height until vegetation clearance. By so doing, ground nesting birds are unlikely to attempt to nest within construction areas;
- all clearance of other suitable vegetation will be undertaken outside the breeding season (typically March-August inclusive for most species), where possible;
- where there will be a gap in activity between site clearance/ soil stripping and the start of construction, then all cleared ground will be maintained in a disturbed state (e.g. through regular harrowing to minimise the risk of ground nesting birds establishing in the lead into construction.
- site inductions and toolbox talks will be provided as appropriate;

- in situations where the above breeding bird mitigation is not possible, an appropriately experienced CoW will check the working area for nests before works commence. If active nests are discovered through this process, then the CoW will advise on appropriate mitigation to ensure that these are not impacted by construction activities. All relevant works will be completed in accordance with this advice and under the supervision of the CoW; and
- consistent with the above, should WCA Schedule 1 bird species be present at the time of construction (to be determined through the committed pre-commencement update surveys) the CoW will advise on species-specific requirements to achieve legislative compliance.

Fish

~~4.7.8~~4.7.9 A Fish Management Plan will specify the measures and supervision required to deliver legislative compliance during installation and drawdown of any cofferdam for (depending on the final option selected) the upgrade of the River Water Abstraction Option or the Canal Water Abstraction Option.

~~4.7.9~~4.7.10 As all construction works within watercourses are subject to regulation and permitting regimes, the Fish Management Plan will be prepared and agreed with the relevant regulator (Environment Agency and/or Marine Management Organisation).

~~4.7.10~~4.7.11 The Fish Management Plan will include details of:

- appropriate timings to minimise potential for capture of sensitive fish species e.g. migratory fish;
- provision for screening of pump intakes to prevent fish being drawn into the pipe/ pump;
- supervision of dewatering of any cofferdam(s) by an appropriately experienced CoW to oversee fish welfare and to support the relocation of any stranded fish or associated wildlife back to the main channel of the relevant watercourse outside the working area; and
- if appropriate, e.g. to meet additional requirements of the relevant regulators, other specialist techniques to support the capture and relocation of fish to the main channel of the relevant watercourse outside the working area prior to drawdown.

Invasive Non-native Species

~~4.7.11~~4.7.12 An updated terrestrial plant INNS survey will be completed prior to site clearance to determine the current location and extent of these INNS within the Proposed Development Site (noting that none were present at the time of the baseline survey).

~~4.7.12~~4.7.13 It will be assumed that aquatic plant and invertebrate INNS are present in all watercourses affected by construction, regardless of the scale of the proposed construction works.

~~4.7.13~~4.7.14 An Invasive Species Management Plan (ISMP) will be prepared to address all relevant INNS to accompany the final CEMP and will be agreed with relevant stakeholders. The ISMP will specify the control/ eradication (as reasonable and practicable), biosecurity measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations. Prior submission and approval of the ISMP is a commitment of the Framework CEMP provided as **Application Doc Ref. 7.1 [APP-160]**.

~~4.7.14~~4.7.15 Biosecurity requirements will address all potential pathways for interaction with and dispersal of INNS, including movements of vehicles, machinery and staff:

- into the Proposed Development Site from third party locations, e.g. during construction mobilisation;
- between different parts of the Proposed Development Site, most especially between different watercourses; and
- from the Proposed Development Site for redeployment elsewhere.

4.8 Animal Welfare Requirements

4.8.1 Mammal/ badger gates will be installed in boundary fences as appropriate to maintain access for nocturnal wildlife into and through the habitat corridor associated with the existing overhead electricity transmission lines connected to the existing National Grid 400kV Substation. Further details will be provided once the locations and alignment of boundary fences has been specified further and confirmed, and these details will be submitted in the final LBMEP to be agreed as a Requirement of the draft DCO (**Application Document Ref. 2.1**) **[APP-005]**.

4.8.2 Vegetation clearance and construction excavations have potential to result in offences under animal welfare legislation. A CoW will be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance.

4.8.3 All excavations will be covered overnight, or where this is not practicable, a means of escape will be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals (e.g. grass snake, badger, brown hare, hedgehog) stray into the construction area and fall into an excavation.

4.9 Lighting

4.9.1 Construction temporary lighting will be arranged so that glare is minimised outside the Proposed Development Site as far as reasonably practicable. Measures to minimise the impact of lighting are detailed in the Lighting Strategy

(**Application Document Ref. 5.11**) [**APP-040**] and Framework CEMP (**Application Document Ref. 7.1**) [**APP-160**].

4.10 Habitat Reinstatement

4.10.1 Terrestrial ~~Habitats~~ habitats that may experience ~~low~~ temporary or otherwise trivial levels of access and disturbance during construction, mainly comprising small areas of species-poor road verge and flood bank grassland and arable farmland, will be reinstated (i.e. returned to a condition consistent with the existing baseline) following the completion of construction This includes land affected by ~~replacement of Mabey Bridge~~the A18 highway improvements, installation of an eel screen and the Potential 132kV Electrical Connection to Northern Powergrid 132kV Substation option, and use of arable fields for ~~temporary~~ construction laydown. As this land is not in the permanent control of the Applicant, no ecological enhancement measures are proposed within these areas.

4.10.2 Some habitats ~~lost~~ removed during construction of permanent infrastructure will also be restored. These areas will remain within the permanent control of the Applicant so will be managed with the aim of increasing (relative to the existing baseline) their biodiversity value. This includes land within and immediately adjacent to the Proposed PCC Site on Keadby Common where the existing species-poor improved grassland and unvegetated disturbed ground will be sown with a locally appropriate native wildflower meadow mixture and appropriately managed thereafter. Such measures are included within the habitat enhancement proposals detailed in Section 5.

4.10.3 The following areas will be reinstated to the original baseline conditions.

Arable Fields Used for Construction Laydown

4.10.4 The arable fields used for construction laydown will be reinstated back to arable farmland in accordance with the requirements of the landowner.

Land Affected by the Existing Temporary ~~Construction Haul~~AIL Road

4.10.5 The vegetation in this area was originally cleared for construction of Keadby 2 Power Station, so there is no new habitat loss for the Proposed Development and instead there is only a deferral of the date for habitat reinstatement. The responsibility and timescales for delivering this habitat reinstatement are currently controlled by conditions on planning permission PA/2019/1595 as varied by planning permission PA/2021/188. Under the draft DCO, it is proposed that these permissions will effectively be extended, and the matters controlled by condition will be secured by equivalently worded requirements in Schedule 2 of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**].

~~4.10.4~~4.10.6 Given the existing requirements, restoration of the land affected by the existing temporary AIL Route cannot contribute to BNG for the Proposed Development as it does not represent additionality. Therefore, the existing haul road has been treated as no change within the BNG assessment.

~~4.10.5~~4.10.7 The original baseline conditions (prior to establishment of the existing temporary ~~haul road~~AIL Route) present in this area were agricultural land, two species-poor native hedgerows on the eastern and western boundaries of the field, and below each of these hedgerows (where temporary bridges are currently located) were small field drains supporting emergent plant species.

~~4.10.6~~4.10.8 During reinstatement:

- the two drain crossings will be removed, and the banks profiled consistent with adjacent unaffected sections of drain (if required);
- the short sections of drain bank exposed by the above works will be sown with a low maintenance grass seed mixture to provide bank stabilisation and minimise potential for erosion while other vegetation present in adjacent areas re-colonises;
- re-establishment of aquatic vegetation within the drains will be left to natural processes, as suitable plant species are present nearby in unaffected sections of drain;
- the field will be returned to agricultural land using a basic agricultural grass seed mixture in accordance with the preferences of the landowner; and
- the access points through the two boundary hedgerows will be planted with a species-rich (i.e. a minimum of five species) mixture of native shrubs planted as a double staggered row.

~~4.10.7~~4.10.9 The planting mixture for the species-rich hedgerows will comprise native flower and fruit-bearing species suitable to the location as listed below:

- hawthorn (*Crataegus monogyna*);
- blackthorn (*Prunus spinosa*);
- field maple (*Acer campestre*);
- dogwood (*Cornus sanguinea* subsp. *sanguinea*);
- guelder rose (*Viburnum opulus*);
- dog rose (*Rosa canina* agg.); and
- osier (*Salix viminalis*).

~~4.10.8~~4.10.10 At least 50% of the planting stock will comprise hawthorn, with all other species contributing no more than 50% in aggregate.

~~4.10.9~~4.10.11 The hedgerow planting method will be as follows:

- plants will be two-year-old transplants at least 450 millimetres (mm) to 600mm high;
- species will be planted so that no one species makes up more than 70% of the total;

- planted in a staggered double row 350mm apart with a minimum of seven plants per metre;
- plantings will be kept clear of weeds until they are established; and
- plantings will be fitted with an appropriate timber stake and a plastic-free biodegradable shrub shelter (all fitted as per manufacturer's recommendations).

~~4.10.10~~4.10.12 The hedgerow will be subject to the draft aftercare maintenance regimes described in **Appendix C**, in which any plants found to be dead or dying within the initial five-year aftercare period will be replaced within the first available planting season.

~~4.10.11~~4.10.13 The newly planted hedgerow will be trimmed in at least the first two aftercare years to encourage bushy growth, allowing the hedge to become taller and wider at each cut.

~~4.10.12~~4.10.14 After the aftercare period, the landowner or agricultural tenant will become responsible for the long-term management and aftercare of all habitats in this area. Where the landowner remains the Applicant, then the hedgerow enhancement management regimes specified in **Section 5** will be extended to cover this area. This will be reviewed and clarified in the final LEMP.

Drains Crossed by Electrical Connections

~~4.10.13~~4.10.15 If the Potential Electrical Connection to the 132kV Northern Powergrid Substation is required, then the associated crossings of minor field drains will be undertaken using small-scale cut and cover methods over an anticipated 6-month period.

~~4.10.14~~4.10.16 Following reinstatement of bank substrates and profiles, the affected areas will be sown with a low maintenance grass seed mixture to provide bank stabilisation and minimise potential for erosion while other vegetation present in adjacent areas re-colonises.

~~4.10.15~~4.10.17 Re-establishment of aquatic vegetation within the drains will be left to natural processes, as suitable plant species are present nearby in unaffected sections of drain.

River Trent Flood Bank

~~4.10.16~~4.10.18 It is anticipated that the activities at the River Water Abstraction Option (if required) will largely be confined to within the existing compound and works to be completed from a boat. However, it is possible that limited access may be required to the flood bank to either side of the compound.

~~4.10.17~~4.10.19 The flood bank is currently managed as closely mown species-poor improved grassland. Any areas within the Proposed Development Site boundary that are disturbed during construction will be sown with a low maintenance grass seed mixture.

Stainforth and Keadby Canal

4.10.184.10.20 It is anticipated that theThe bank-top construction activities at the Canal Water Abstraction Option (if required) will largely be confined to within the existing compound/ hardstanding previously used for construction of the Keadby 2 Power Station cooling water intake. No re-instatement of habitats was required for the preceding Keadby 2 Power Station. Given this, no new impacts on semi-natural habitats are anticipated for construction of the Proposed Development and habitat reinstatement is not considered necessary.

4.10.194.10.21 Vegetation establishment will be left to natural processes, consistent with the historic baseline (before works for Keadby 2 Power Station and as visible in Google Earth) of hardstanding and ruderal vegetation.

Highway Improvements at the Access off the A18

4.10.204.10.22 There is potential for localised disturbance of existing species-poor grassland verges and banks for temporary short-duration laydown, vehicle access, as well as ground disturbance works to install foundations for the replacement of Mabey Bridge. Works for the latter would be largely confined to the footprint of the existing Mabey Bridge.

4.10.214.10.23 Any vegetation disturbed by the above activities will be reinstated as set out above for the drains crossed by the Potential Electrical Connection to the 132kV Northern Powergrid Substation. In addition, land on the north side of Mabey Bridge is included within a larger area allocated for biodiversity enhancement, as described in Section 5 of this LBMEP.

5.0 LANDSCAPE AND BIODIVERSITY ENHANCEMENT

5.1 Approach

5.1.1 The landscape and visual amenity assessment presented in **Chapter 14**: Landscape and Visual Amenity (ES Volume I - **Application Document Ref. 6.2**) [**APP-057**) including **Chapter 14**: Landscape and Visual Amenity of the ES Addendum (**Document Ref. 6.2.14-Rev 02**) concludes that the Proposed Development will result in significant adverse effects on visual amenity from Viewpoint 1 (Chapel Lane West, Keadby), Viewpoint 2 (Gate Keepers Residence, Vazon Bridge, Keadby) and Viewpoint 4 (PRoW (KEAD9, KEAD10) north of Keadby) and in the event of a future baseline without the Keadby 1 Power Station built structure, for the operation assessment scenario for Viewpoint 6 (Trunk Road, Keadby). However, the opportunity for mitigation of the visual effects of the Proposed Development is limited due to the size and scale of the Proposed Development. As shown in the assessment, the effects on visual amenity largely relate to the height of the tallest structures; as such it is considered that the addition of landscape features such as trees and woodland would not be effective in reducing the effects of these on visual amenity. However, there remains a need for appropriate restoration of the landscape following construction, and enhancements to the landscape character and improvements to the green infrastructure network to meet requirements of local and national planning policy. Existing vegetation provides screening and softening of views of lower structures from non-industrial viewpoints.

5.1.2 The ecological impact assessment presented in **Chapter 11**: Biodiversity and Nature Conservation (ES Volume I - **Application Document Ref. 6.2**) [**APP-054**] including **Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11-Rev 02**) identified no potentially significant adverse effects as a result of the temporary and permanent loss of habitat during construction. Habitat restoration and enhancement is proposed to maintain and improve habitats for biodiversity. This includes benefits for two Local Wildlife Sites (LWS).

5.1.3 Proposals for landscape and biodiversity enhancement have been designed to achieve the following outcomes:

- no net loss of biodiversity and a quantifiable gain for biodiversity as a result of the Proposed Development;
- enhance field drain habitats for the benefit of water vole to compensate for temporary and permanent losses of habitat to the Proposed Development;
- enhance the Hatfield Waste Drain and Stainforth and Keadby Canal for aquatic wildlife, birds, pollinators and other species;
- enhance grassland habitats for the benefits of pollinators and other invertebrates, birds, badger, brown hare and other species;

- provide nesting and roosting features for birds and bats to address a general lack of natural features in the local area to meet this need; and
- enhance the habitat and green infrastructure network adjacent to and through the Proposed Development Site, including provisions of habitats connected to two LWS and the former Keadby Ash Tip.

5.2 Habitat Enhancements

5.2.1 Measures to enhance the biodiversity and green infrastructure value of the Proposed Development Site through establishment of new habitats and improvement of existing habitats are proposed. The areas to be enhanced are shown on **Figure 1** and described below. Once created the new habitats will be appropriately maintained (as described below) for a minimum period of 25 years (the proposed lifetime of the Proposed Development).

Habitat Creation Principles Supporting Delivery of Biodiversity Enhancement

5.2.2 Where new native habitats are to be created, or new native planting undertaken, the following principles will apply:

- all seed mixes and planting stock will be ordered as early as reasonably practicable following a decision to commence the project to allow supply to be met without risk of substitution;
- all seed mixes and planting stock will be sourced from a specialist producer of British grown native plants and/ or seed who can source-identify all stock (i.e. not a non-specialist nursery that buys in stock or an agricultural/ general merchant that buys stock from diverse sources, including non-British sources); and
- terms of supply will include a condition that no part of the order shall be substituted with stock of alternative species or origin and that any change must be mutually agreed.

5.2.3 The above requirements will be incorporated into contractor specifications and contracts, as appropriate, to deliver genuinely native plantings in accordance with the biodiversity objectives of this LBMEP.

Enhancement Proposals

Proposed PCC Site – Grassland Habitat Creation

5.2.4 Keadby Common currently contains ~~10.22ha of~~ species-poor improved grassland habitat ('modified grassland'), all of which will be removed prior to construction. Post-construction, there will be areas of land around the perimeter of the Proposed PCC Site, both inside and outside the security fence, that are suitable for use to provide biodiversity enhancement and visual amenity. As a minimum, 3ha of species-rich neutral grassland will be established within and

adjacent to the Proposed PCC Site. ~~There is potential to~~Options to increase this further will be considered at detailed design stage, see Section 5.3.

5.2.5 These areas will be sown with a site-appropriate native neutral wildflower grassland. An indicative seed mixture suitable for this purpose is the Emorsgate EM4 Meadow Mixture for Clay Soils. The composition of this grassland is detailed in **Appendix A**.

5.2.6 The regular mowing and removal of arisings from the existing grassland appears to have depleted nutrient levels in the former arable soils sufficiently for the successful establishment of wildflower grassland. In addition, the removal and storage of soils during construction allows control over what substrates are returned post-construction. Given this, topsoil will not be reinstated in areas where grassland will be seeded and consequently soil testing is not considered necessary. The same principles will apply if soils need to be imported to raise ground levels to establish a platform for the Proposed PCC Site.

5.2.7 Ground will be suitably prepared in advance of seeding. Management, in the first year (potentially extending into Year 2, depending on the time of sowing and rate of establishment), will be in accordance with the aftercare regime recommended by the seed producer. This will involve:

- periodic mowing in the first year after sowing to maintain a sward height of 40-60mm, removing all arisings for disposal in a location pre-agreed with the ecologist or landscape architect where this would not conflict with biodiversity objectives and habitat management;
- spot treatment of perennial weeds such as broad-leaved dock (*Rumex obtusifolius*), creeping thistle (*Cirsium arvense*) and spear thistle (*Cirsium vulgare*) with an approved herbicide;
- a review of requirements for Year 2 at the end of aftercare Year 1, moving into the long-term nature conservation management regime (see below) if appropriate.

5.2.8 After the initial aftercare period of management, the grassland will be maintained through a nature conservation regime. The regime will be specified in the final LBMEP with reference to the final layout for the Proposed PCC Site but will allow for:

- mowing of plots on rotation so that in any one year there always remains areas of longer tussocky grassland suitable to provide foraging habitat for barn owl and other birds, and places of refuge for other wildlife, e.g. over-wintering invertebrates, when the remainder of the grassland is cut;
- mowing grassland to 50mm height between late July and early September, with all arisings removed;

- a second cut, if required (not likely to be necessary given existing substrates but this will be determined later through monitoring) in April to reduce the vigour of grass species and maximise flower production by herb species;
- periodic control of scrub cover if it establishes greater than 10% total cover, and pernicious weeds such as creeping thistle, spear thistle and broad-leaved dock where these start to dominate to the exclusion of other flora; and
- all arisings will be deposited in a suitable area in the wider landholding (as agreed with the ecologist or landscape architect) to create habitat piles suitable for use by grass snake for egg laying.

5.2.9 The above low intensity management regime will also be extended to an area of retained species-poor grassland within the wayleave for the existing overhead electricity transmission lines associated with the existing National Grid 400kV Substation. This area of grassland is not included within the area of habitat used to calculate the biodiversity net gain (i.e. it has been treated as 'retained' in the assessment) as without re-seeding it is not certain how quickly the grassland will respond to the beneficial change in management. With the enhancements proposed, it is possible to demonstrate a biodiversity net gain without a need to account for this area; inclusion of this small additional plot therefore represents an additional beneficial measure over and above the stated gain.

5.2.10 Allowance will also be made for a native scrub component within all of the above grassland areas. This will result in grassland habitat of more diverse structure and consequently of higher biodiversity value that uniformly open grassland.

5.2.11 The planting mixture will comprise native flower and fruit-bearing species suitable to the location, as indicated by the existing baseline within the Proposed PCC Site and on adjacent land. Native species suitable to this location include:

- hawthorn (*Crataegus monogyna*);
- dog-rose (*Rosa canina* agg.);
- sweet-briar (*Rosa rubiginosa*);
- dogwood (*Cornus sanguinea* subsp. *sanguinea*);
- wild privet (*Ligustrum vulgare*);
- spindle (*Euonymus europaeus*); and
- buckthorn (*Rhamnus cathartica*).

5.2.12 The extent of scrub will not contribute more than 5% of the total grassland cover and will be located so as not to impede implementation of the specified grassland management regimes.

5.2.13 All scrub planting will be notch planted at 1.5m and 2.5m spacings and a plastic-free biodegradable spiral and stake. All new scrub planting will be subject to the maintenance regimes described in **Appendix C**.

5.2.14 The establishment of species-rich grassland and its associated integral scrub will be monitored by an ecologist and a landscape architect as set out in Section 6.

~~Alternative~~Additional AIL Route – Grassland Habitat Creation and Enhancement

5.2.15 The relevant land parcel shown on **Figure 1** is located to the north of Keadby 1 Power Station. The total area of grassland vegetation in this area is 1.48ha.

5.2.16 The corridor of land affected by construction of the ~~Alternative~~Additional AIL Route will be reinstated and resown as described above for the Proposed PCC Site.

5.2.17 The wider land parcel already supports semi-improved neutral grassland with a moderate diversity of herb species. However, it is heavily invaded by bramble scrub, is not managed, and contains a relatively high cover of pernicious weed species (e.g. thistles). Therefore the wider area of grassland will be managed to bring it back into more favourable condition and management. Accordingly:

- At least 90% of the bramble scrub will be removed, and treated to prevent regrowth;
- Weed control, mowing regimes and removal of arisings will be undertaken as described above for the Proposed PCC Site.

Proposed PCC Site – Attenuation Pond

~~5.2.15~~5.2.18 In addition to the above grassland enhancements, the indicative site layout includes a surface water attenuation pond. The design of the attenuation pond will be secured as a requirement of the draft DCO (**Application Document Ref. 2.1**) **[APP-005]** but the current preference is for a concrete attenuation pond, possibly with a thin overlaying layer of soil, to minimise maintenance requirements going forward. Given this, the attenuation pond is only likely to accrue a minor incidental biodiversity value and minimal emphasis is therefore placed upon it for the purpose of this LBMEP.

Land Immediately West of the North Pilfrey Bridge and North of Mabey Bridge – Grassland Habitat Enhancement

~~5.2.16~~5.2.19 Between the existing site access road and the South Soak Drain is a broad verge/ small fields that are currently species-poor improved grassland ('modified grassland') maintained through regular mowing. There is a similar triangular area of grassland adjacent to Mabey Bridge. ~~This area~~These grasslands ~~(laydown Area 2c on **Figure 5.1** in ES Volume III – **Application Document Ref. 6.4**)~~ can be ~~improved~~ enhanced following construction to create

a minimum of ~~1.7ha~~3.3ha of species-rich neutral grassland. This location connects to the Stainforth and Keadby Canal Corridor LWS, so the proposed new grassland will enhance the LWS.

~~5.2.17~~5.2.20 The regular mowing and removal of arisings from the existing grassland is likely to have depleted nutrient levels in the former arable soils sufficiently for the successful establishment of wildflower grassland, but soil testing will be undertaken to confirm this and as a basis for agreement of the final specification.

~~5.2.18~~5.2.21 ~~Within laydown Area 2c, there~~There is also an existing 0.5ha car park currently in use for the construction of Keadby 2 Power Station. The current planning permission (reference PA/2018/1950) requires the restoration of the 'Site' on or before 21 November 2022 after which it is intended that it be broken out and reinstated to a suitable condition consistent with the adjacent land-use (the improved grassland). However, under the draft DCO, it is proposed that this permission will effectively be extended to allow this area to be beneficially used as laydown for the Proposed Development. The matters controlled by condition, including a later date of reinstatement, will be secured by equivalently worded requirements in Schedule 2 of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**]. It is also proposed that this area be used for species-rich neutral grassland habitat creation rather than simply reinstated to its former condition, so the proposed approach will deliver additionality.

~~5.2.19~~5.2.22 Following completion of construction activities for the Proposed Development, the existing grassland turf, and the hardstanding of the car park, will be removed to allow ground preparation and sowing with a site-appropriate native neutral wildflower grassland. Pending the results of soil testing it is expected that this grassland will also be of a type comparable with the Emorsgate EM4 Meadow Mixture for Clay Soils (see **Appendix A**).

~~5.2.20~~5.2.23 The ground will be suitably prepared in advance of seeding. Once sown, the management regimes specified above for Area 1 will be applied. Monitoring will also be as specified above for Area 1.

~~5.2.21~~5.2.24 The establishment of species-rich grassland will be monitored by an ecologist and a landscape architect as set out in Section 6.

~~Triangular Plot Land Immediately North-east of~~ Mabey Bridge and North Pilfrey Bridge – ~~Grassland Habitat Enhancement and~~ Scrub Creation

~~5.2.22 Laydown Area 1 on **Figure 5.1** in ES Volume III – **Application Document Ref. 6.4**) comprises another plot of species-poor improved ('modified') grassland (0.2ha). Following use as laydown for the early construction works associated with the Mabey Bridge replacement and A18 junction improvement, this will be sown with a species-rich neutral grassland seed mixture. The specifications provided above for the other grassland areas will apply to this plot also. This location connects to the habitat corridor of the Hatfield Waste Drain LWS, so the proposed new grassland will enhance the LWS.~~

5.2.235.2.25 In addition, aA stand (0.1ha 2ha) stand of dense mixed scrub, with a subsidiary contribution from standard trees, will be planted by Mabey Bridge to compensate for losses of scrub elsewhere during construction and to enhance the riparian corridor next to the Hatfield Waste Drain. This scrub will link the grassland with the new hedgerow along the access road. The final planting specification for this scrub will reflect the diversity of species included in the hedgerow planting but will be appropriate to the space available.

5.2.245.2.26 The planting mixture will comprise native flower and fruit-bearing species suitable to the location, as indicated by the existing baseline within the Proposed PCC Site and on adjacent land. Native species suitable to this location include:

- hawthorn (*Crataegus monogyna*);
- dog-rose (*Rosa canina* agg.);
- sweet-briar (*Rosa rubiginosa*);
- dogwood (*Cornus sanguinea* subsp. *sanguinea*);
- wild privet (*Ligustrum vulgare*);
- spindle (*Euonymus europaeus*); and
- buckthorn (*Rhamnus cathartica*); and.
-
- wild cherry (*Prunus avium*) – up to 5 standard trees to increase the structural diversity of the planting as enhancement of the Hatfield Waste Drain.

5.2.27 A comparable scrub planting (excluding wild cherry) will also be planted adjacent to North Pilfrey Bridge (0.1ha).

5.2.255.2.28 All scrub planting would be notch planted at 1.5m and 2.5m spacings and protected with a plastic-free biodegradable spiral and stake.

5.2.265.2.29 The scrub planting would be subject to the draft maintenance regimes described in **Appendix C**, in which any plants found to be dead or dying within the initial five-year aftercare period will be replaced within the first available planting season. Following the completion of an initial five-year aftercare period all new planting plots will undergo a biannual condition assessment and an appropriate programme of works developed to address changes in condition and site requirements. Such work may include additional replacement planting, fence repair/ removal, pruning, coppicing, or thinning out of plots to encourage establishment.

5.2.275.2.30 The establishment of species-rich grassland and scrub will be monitored by an ecologist and a landscape architect as set out in Section 6.

Access Road – Species-rich Native Hedgerow Creation

~~5.2.28~~5.2.31 There is an existing hedgerow on the eastern margin of the central section of the existing site access road between Mabey Bridge and North Pilfrey Bridge. Additional plantings of 500m total length are proposed to extend the existing hedgerow at its northern and southern ends, and to connect with areas of scrub planting (see above).

~~5.2.29~~5.2.32 The planting mixture will comprise native flower and fruit-bearing species suitable to the location. The final species selection will be made from the list of shrub species provided above for the new scrub habitat, with up to 50% of the planting stock comprising common hawthorn, and all other species contributing no more than 50% in aggregate.

~~5.2.30~~5.2.33 The hedgerow planting method will be as follows:

- plants will be two-year-old transplants at least 450 millimetres (mm) to 600mm high;
- species will be planted so that no one species makes up more than 70% of the total;
- planted in a staggered double row 350mm apart with a minimum of seven plants per metre;
- plantings will be kept clear of weeds until they are established; and
- plantings will be fitted with an appropriate timber stake and a plastic-free biodegradable shrub shelter (all fitted as per manufacturer's recommendations).

~~5.2.31~~5.2.34 The newly planted hedgerow will be trimmed in at least the first two years to encourage bushy growth, allowing the hedge to become taller and wider at each cut.

~~5.2.32~~5.2.35 Once established the hedgerow will be managed so it attains a minimum average height and width of 1.5m. To achieve this the hedgerow will be trimmed no more frequently than once every other year.

~~5.2.33~~5.2.36 Trimming will be timed for during January and February when the majority of fruit has been taken by local wildlife and carried out according to best practice guidance. Access for this is possible via the existing site access road.

~~5.2.34~~5.2.37 The sides, ends and tops of the hedgerow will be trimmed as far as practicable to achieve an ‘A’ profile.

~~5.2.35~~5.2.38 Following trimming operations all significant arisings (cuttings) will be removed so as not to impede grassland growth or management.

~~5.2.36~~5.2.39 The establishment of the hedgerow will be monitored by an ecologist and a landscape architect as set out in Section 6.

~~Alternative~~Additional AIL Route – Creation and Reinstatement of Plantation Woodland and New Tree Plantings~~s~~

5.2.40 The loss of two free-standing ash trees next to Trent Road will be compensated through plantings of four native trees (not ash due to the prevalence of ash dieback disease) on the verge adjacent to Trent Road.

5.2.41 The section of young native plantation woodland next to Chapel Lane affected by construction will be re-planted and additional native plantation woodland will be provided by Trent Road.

5.2.42 The planting mixture will comprise native tree and shrub species suitable to the location. The final species selection will be made from the list of tree and shrub species suitable to the location and include:

- Alder (*Alnus glutinosa*);
- Bird cherry (*Prunus avium*);
- Common oak (*Quercus robur)*;
- Field maple (*Acer campestre);*
- Hazel (*Corylus avellana*),
- Hawthorn (*Crataegus monogyna*),
- sweet-briar (*Rosa rubiginosa*);
- dogwood (*Cornus sanguinea* subsp. *sanguinea*);
- wild privet (*Ligustrum vulgare*)*;* and
- spindle (*Euonymus europaeus*).

5.2.43 All shrub and woodland planting would be notch planted at 1.5m and 2.5m spacings and protected with a plastic-free biodegradable spiral and stake.

5.2.44 All feathered, heavy and extra heavy standard tree planting will be pit planted in pits of a minimum size to accommodate the full spread of roots/ rootball plus 100mm. All to be protected with a double low stake.

5.2.45 The tree and shrub planting would be subject to the draft maintenance regimes described in **Appendix C**, in which any plants found to be dead or dying within the initial five-year aftercare period will be replaced within the first available planting season. Following the completion of an initial five-year aftercare period all new planting plots will undergo a biannual condition assessment and an appropriate programme of works developed to address changes in condition and site requirements. Such work may include additional replacement planting, fence repair/ removal, pruning, coppicing, or thinning out of plots to encourage establishment.

5.2.46 The establishment of tree and shrub will be monitored by an ecologist and a landscape architect as set out in Section 6.

Keadby Common Drains

~~5.2.37~~5.2.47 The final LBMEP, secured through a Requirement of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**], will include details of a programme of field drain enhancement works to re-instate areas with open water more suitable to support a greater range of aquatic biodiversity, including water vole. The target drains are those on the southern, eastern and western boundaries of Keadby Common (~~800m~~ 790m total length~~/ 0.08ha~~).

~~5.2.38~~5.2.48 The programme of enhancement works will commence before the start of the main construction period to provide enhanced habitat suitable for occupation by any water voles present at that time within the field drain (Drain 4) to be infilled during construction.

~~5.2.39~~5.2.49 The enhancement works will be planned to avoid any water vole burrows present at that time. Given existing survey data the sub-optimal habitat conditions currently present, water voles are not anticipated to be a significant constraint at the time of these works.

~~5.2.40~~5.2.50 The following specific actions will be included in the final LBMEP:

- removal of excess silt and emergent (swamp) vegetation to re-instate open water conditions;
- cutting back of overhanging trees to reduce over-shading, in support of the successful establishment of aquatic vegetation suitable to sustain a more diverse faunal assemblage, including water vole;
- possible tie-in with the surface water drainage scheme for the Proposed Development to improve water supply;
- sowing of adjacent land, as described above, with species-rich wildflower grassland.

Stainforth and Keadby Canal

5.2.51 The canal is currently of relatively low biodiversity value due to a lack of marginal vegetation and a natural bank structure. Therefore in order to mitigate the very small impact from the proposed Canal Water Abstraction Option, it is proposed that the adjacent section of the northern margin of the canal be enhanced to provide a linear stand of wetland marginal vegetation.

5.2.52 To achieve this pre-planted coir rolls will be installed by a specialist contractor within the marginal zone along the north bank. The installation method will be suitable to the site and bank conditions.

5.2.53 The establishment of the aquatic plants within the coir rolls will be monitored by an ecologist and a landscape architect as set out in Section 6.

Species Specific Measures

~~5.2.41~~5.2.54 Additional enhancement measures for species are proposed within the Proposed Development Site and the adjacent former Keadby Ash Tip. The latter is also land within the control of the Applicant. Habitat creation is not appropriate in this area given the existing biodiversity value (see **Appendix 11C**: Preliminary Ecological Appraisal Report, ES Volume II – **Application Document Ref. 6.3**) [**APP-078**] including in **Appendix 11C:** Preliminary Ecological Appraisal Report of the ES Addendum (**Document Ref 6.2.11-Rev 02**~~,~~ and currently there is no anticipated need for habitat management or intervention over the medium-term.

~~5.2.42~~5.2.55 The following species features will be provided:

- 3 No. pole mounted barn owl towers - located on Figure 1 and specified in **Appendix B**;
- 5 No. Schwegler 1FD or comparable bat boxes suitable for maternity roosting – to be located on suitable trees within the former Keadby Ash Tip;
- 5 No. Schwegler 2F universal bat boxes, or comparable boxes – to be located on suitable trees within the former Keadby Ash Tip;
- 5 No. tawny owl nesting boxes (suitable also for other bird species requiring larger nesting cavities) – to be located on suitable trees within the former Keadby Ash Tip; and
- ring-barking of suitable trees within the former Keadby Ash Tip to enhance the resource of standing deadwood available to willow tit.

~~5.2.43~~5.2.56 The target species listed above are those that require mature trees or standing deadwood for roosting or nesting, conditions that are currently absent or in short supply due to the relatively young age of the woodland and scrub present within and adjacent to the Proposed Development Site.

~~5.2.44~~5.2.57 Prior to submission and agreement of final specifications with NLC, an ecologist will undertake a walkover survey to identify suitable locations for the identified interventions. These locations will be marked on a plan to accompany the final specification.

~~5.2.45~~5.2.58 Once installed, the artificial barn owl, bird and bat boxes will be inspected annually in January or February to confirm their ongoing presence and to identify any requirements for remedial action. All artificial boxes that cannot be re-found, that are found to be damaged, or that require other remedial action will be replaced/ rectified before the end of March in the same year, subject to the commercial availability of suitable replacement features to meet this deadline.

5.3 Comparison of Permanent Habitat Losses and Gains

5.3.1 A comparison to the balance between habitat losses and gains is provided within the ~~standalone~~ BNG assessment (Appendix D). Therefore, the purpose

of this LBEMP is only to set out the specifications proposed to achieve the intended BNG outcome.

~~5.3.1 The permanent losses of habitat for the Proposed Development are summarised in Section 3.2 and have been carried forward as the basis for structured comparison and quantification of habitat losses and gains. To support this and demonstrate engagement with planning policy on no net loss and net gain, use has been made of the calculator tool published by Natural England for this purpose (Natural England, 2019). This is not otherwise a formal requirement for NSIP as long as it is demonstrated how the Proposed Development has '*taken advantage of opportunities to conserve and enhance biodiversity*' (paragraph 5.3.4, DECC, 2011a).~~

~~5.3.2 It should be noted that the assessment provided focusses on land affected by permanent land take as well as the land to be used solely for enhancement. As such, all other land encompassed within the very large Proposed Development Site that would not be directly used or affected has been excluded from the assessment. While there might be additional temporary habitat disturbances during construction, these are all localised and minor and not all are certain to occur, as explained elsewhere in this LBMEP (see Sections 3.2 and 4.10). All land temporarily disturbed by such activities will be reinstated in accordance with the habitat reinstatement approach set out in Section 4.10.~~

~~5.3.3 Given these considerations and the lack of any legal or planning policy driver for a different approach, it is considered that clarity is aided by this highly focussed approach. It is also consistent with typical expectations for reporting of habitat losses and gains for the purposes of ecological impact assessment and EIA, while providing greater confidence that no net loss and a measurable biodiversity gain can be achieved. The Natural England calculator is therefore only used to support transparency and interrogation of the assessment by stakeholders.~~

~~5.3.4~~5.3.2 The assessment of the balance between habitat losses and gains has been based on the provision of the identified habitat creation measures in all of the indicative areas shown on **Figure 1**, although not all of this land would be required to achieve the stated gain. The location and extent of land for biodiversity enhancement is subject to ongoing review and will be confirmed in the final LBMEP. However, the level of biodiversity gain to be provided would remain as committed ~~in this LBMEP~~in the BNG assessment (**Appendix D**).

~~A conservative approach has been used within the calculations to account for uncertainties regarding the final layout for the Proposed Development. The current assessment is therefore precautionary (i.e. worst-case, both in terms of losses and in the gains achievable) and there are a number of reasons why the land required to achieve the committed gain and its location may change later. Specifically:~~

~~the current assessment takes a worst-case position and assumes that all land within the Proposed PCC Site that has not been allocated for biodiversity~~

~~enhancement would be permanently lost to buildings and hard landscaping. This is overly precautionary, but it is a necessary assumption until the final site layout is fixed following detailed design.~~

~~the potential condition (a quality indicator) achievable for all new habitats is precautionary and likely overly so. So, as example of this, all new grasslands have been assumed to achieve 'moderate' condition even though 'fairly good' condition is realistically achievable. Similarly, the attenuation pond is assumed to achieve 'poor' condition even though a higher condition might be achievable later after consideration of the design options available (but noting the preference for a concrete liner).~~

~~realistic precautionary timeframes are adopted for the committed habitat creation i.e. up to ten years to achieve target condition of grassland habitats. This represents a typical management period when establishing new habitats. In reality, given the proposed management regimes, measurable biodiversity gains for wildlife (e.g. invertebrates) from the new grasslands can be expected by Year 5 and before the final target condition is achieved for the habitat itself.~~

~~no claims are made that the new habitats would represent priority habitats. Instead, the only aim is to achieve a genuine enhancement. So, for example, the existing poor quality 'modified grasslands' will be replaced with habitat more typical of favourably managed semi-natural grasslands i.e. 'other neutral grassland'. The management regimes necessary to achieve this are committed in this LBMEP (see above), and the standard guidance (Natural England, 2019) advises that such habitat has a 'low difficulty of creation'. Given this it is reasonable to assume that the committed habitats can and will be delivered.~~

~~It is not possible to compensate like for like for two habitat types experiencing minor habitat losses to the Proposed development i.e. scrub and OMH. However, functionally comparable habitat is delivered:~~

~~a shortfall in replacement plantings of hawthorn scrub is addressed through the proposed hedgerow plantings of comparable composition and structure described in this LBMEP; and~~

~~a shortfall in OMH is addressed through the proposed native flower-rich grassland habitat described in this LBMEP i.e. habitat that can be expected to benefit pollinators and other terrestrial invertebrates.~~

~~In specific relation to the OMH, the current approach for assessing the balance between habitat losses and gains requires like for like replacement of OMH regardless of the specific quality and scale of loss i.e. there is no flexibility to consider context despite the related guidance advising (and relevant to the current situation) '*artificially created areas that mimic semi-natural habitats such as species-rich grassland would also be in scope* [of this habitat type]' (Natural England, 2019). Creation of new OMH is not possible as suitable ground conditions are not available and, even then, there would be low confidence in the ability to reinstate comparable OMH. The affected OMH is otherwise, as explained in **Chapter 11** (ES Volume I, **Application Document Ref. 6.2**), not~~

~~typical of the wider OMH resource (although moderate condition is assumed to permit precautionary assessment) so it is considered that creation of flower-rich grassland is a valid approach to address the small loss of OMH to the Proposed Development. The proposed new grassland habitat adds to the diversity and complexity of existing flower-rich habitats associated with the former Keadby Ash Tip and the connected Stainforth and Keadby Canal Corridor LWS (extending this into adjacent land), and therefore directly complements and diversifies habitat quality for the notable terrestrial invertebrate assemblage that is focussed on the former Keadby Ash Tip (as described in **Appendix 11C** – ES Volume II (**Application Document Ref. 6.3**)).~~

~~The additionally proposed species-specific interventions cannot be factored into the habitat assessment, but otherwise represent site-appropriate biodiversity enhancement. Similarly, no attempt is made to quantify the additional biodiversity gain achievable from management of retained areas of grassland or from inclusion of a minor scattered scrub component within grassland areas. This is not considered necessary given the assessment is more precautionary (less favourable to the Applicant) without these inclusions. The potential gains achievable from these additional measures are also harder to demonstrate unequivocally, so the terms of reference for assessment are simpler if they are excluded. Consequently, there can be greater confidence in the likely outcome of a gain for biodiversity.~~

~~The data entered into the calculator tool and its results are provided in **Appendix D**.~~

~~The summary findings confirm:~~

~~a gain in habitat units of 10.6% is achievable;~~

~~a gain in hedgerow units of 35.9% is achievable; and~~

~~the broad aims of planning policy to achieve no net loss and a net gain are met.~~

6.0 MONITORING

6.1.1 A landscape architect and/ or an ecologist will undertake post-intervention habitat monitoring annually in June or July for a period of ten years. This timeframe reflects the advised time period for the establishment of the committed grassland habitats and is also considered appropriate to provide sufficient time to confirm a net gain for biodiversity.

6.1.2 The monitoring approach will be provided with the final LBMEP and will involve a condition assessment walkover survey to complete the following:

- review of the establishment of seed mixtures, wetland plantings, and tree and shrub plantings, and review of any requirements for remedial actions e.g. replacement of failed stock or re-seeding, or identification and rectification of damage;
- review of grassland structure and composition, and associated implications for the agreed management regimes;
- review of any native or non-native weed issues requiring treatment, or requirements for scrub control where the cover exceeds 5% of the total grassland area; and
- review of establishment of vegetation within the pond and any requirements for management e.g. periodic vegetation clearance.

6.1.3 An ecologist will also make a ground level check of the barn owl, bird and bat boxes in January or February each year to identify any requirements for remedial action.

6.1.4 A brief monitoring report will be prepared in each year and provided to NLC as a record of compliance.

7.0 ROLES AND RESPONSIBILITIES

7.1 The Applicant and/ or the Appointed Main Contractor

7.1.1 The Applicant and/ or appointed main contractor will be responsible for:

- correct instruction of all parties contributing to delivery of the final approved LBMEP (including but not restricted to the Applicant's staff and their appointed ecologists, landscape architects, CoW, landscape contractors, construction contractors and management organisations);
- compliance with the final approved LBMEP, relevant legislation and any relevant planning commitments. This includes appropriate maintenance of new habitats for a minimum period of 25 years;
- keeping the appointed ecologist/ landscape architect/ arboriculturalist/ CoW informed of work activities that require support and supervision, so that it is clear when attendance on-site is required;
- enacting/ enforcing recommendations made by the ecologist/ landscape architect/ arboriculturalist/ CoW, or otherwise agreeing an appropriate alternative course of action, if it is subsequently determined that previous advice is not practicable or is out of date; and
- keeping a record of measures taken to deliver the requirements of the final LBMEP, to provide an auditable record of compliance.

7.2 The Appointed Ecologist

7.2.1 The appointed ecologist (including ecological CoW) will be responsible for:

- advising the Applicant on ecological matters and requirements for compliance with relevant legislation and protected species licences, providing support as instructed, and monitoring compliance with the final approved LBMEP;
- monitoring and assessing progress with delivery of biodiversity objectives and target condition of habitats on an annual basis for the first ten years following commencement of operation of the Proposed Development;
- reviewing the LBMEP at appropriate periodic intervals and revising management requirements as necessary at least once every five years thereafter for the duration of the LBMEP (minimum of 25 years); and
- providing the Applicant with survey reports and other written evidence required in accordance with the agreed scope of work and contractual obligations.

7.3 The Appointed Landscape Architect/ Arboriculturalist

7.3.1 The appointed landscape architect/ arboriculturalist (including landscape and arboricultural CoW) will be responsible for:

- monitoring and assessing the landscape related elements of the approved LBMEP for their effectiveness on an annual basis for the first five years following commencement of operation of the Proposed Development and then for the following five-year period and least once every five years subsequently for the duration of the LBMEP (minimum of 25 years);
- ensuring that the landscape related elements of the approved LBMEP are reviewed at the end of the five year initial monitoring and assessment stage and amended accordingly for the following five year period and subsequently for the duration of implementation of the LBMEP. The LBMEP shall be amended accordingly to suit any changing landscape conditions and ultimately inform the maintenance operations throughout the operational life of the Proposed Development; and
- ensuring that any reviews associated with landscape related elements of the approved LBMEP clearly identifies any changes to site conditions and circumstances, whether the aims and objectives of the approved LBMEP are being met, and where identified changes are needed to existing management practices and timeframes.

8.0 REFERENCES

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FIGURES

Figure 1: Indicative Landscape and Biodiversity Enhancement Proposals

Revision: 02 Drawn: JW Checked: CA Approved: HN Date: 05/04/2022

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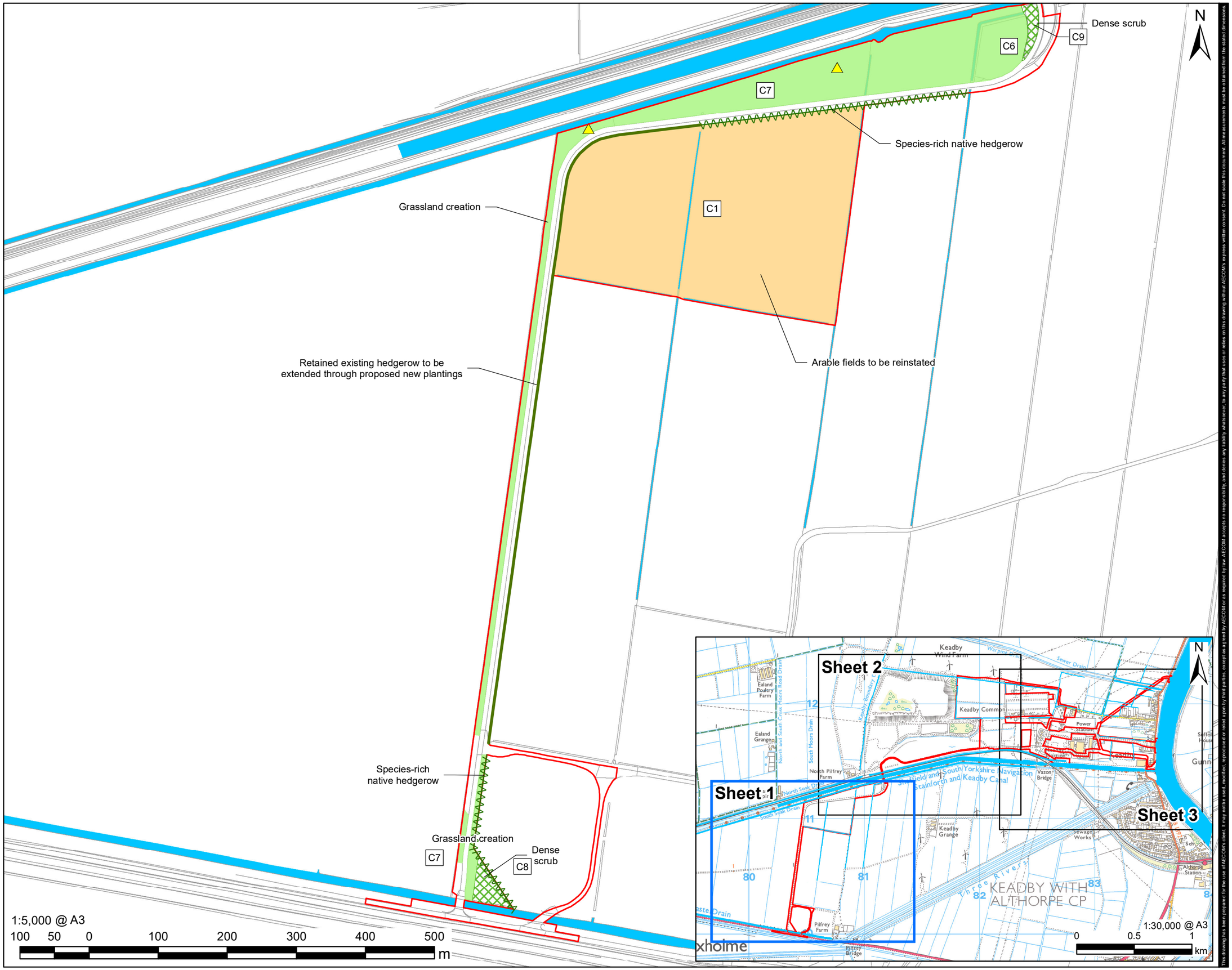

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

APPLICANT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

- The Order Limits
- Running Water
- Grassland
- Proposed Dense
- Reinstated Arable
- Proposed Species-Rich Native Hedgerow
- Retained Existing
- Indicative Locations for Barn Owl Towers

NOTES

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order Regulation 5(2)(o) - Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009

ISSUE PURPOSE

DCO APPLICATION

PROJECT NUMBER

60625943

SHEET TITLE

Landscaping and Biodiversity Management and Enhancement Plan
Sheet 1 of 3

SHEET NUMBER

Application Document Ref. 5.10

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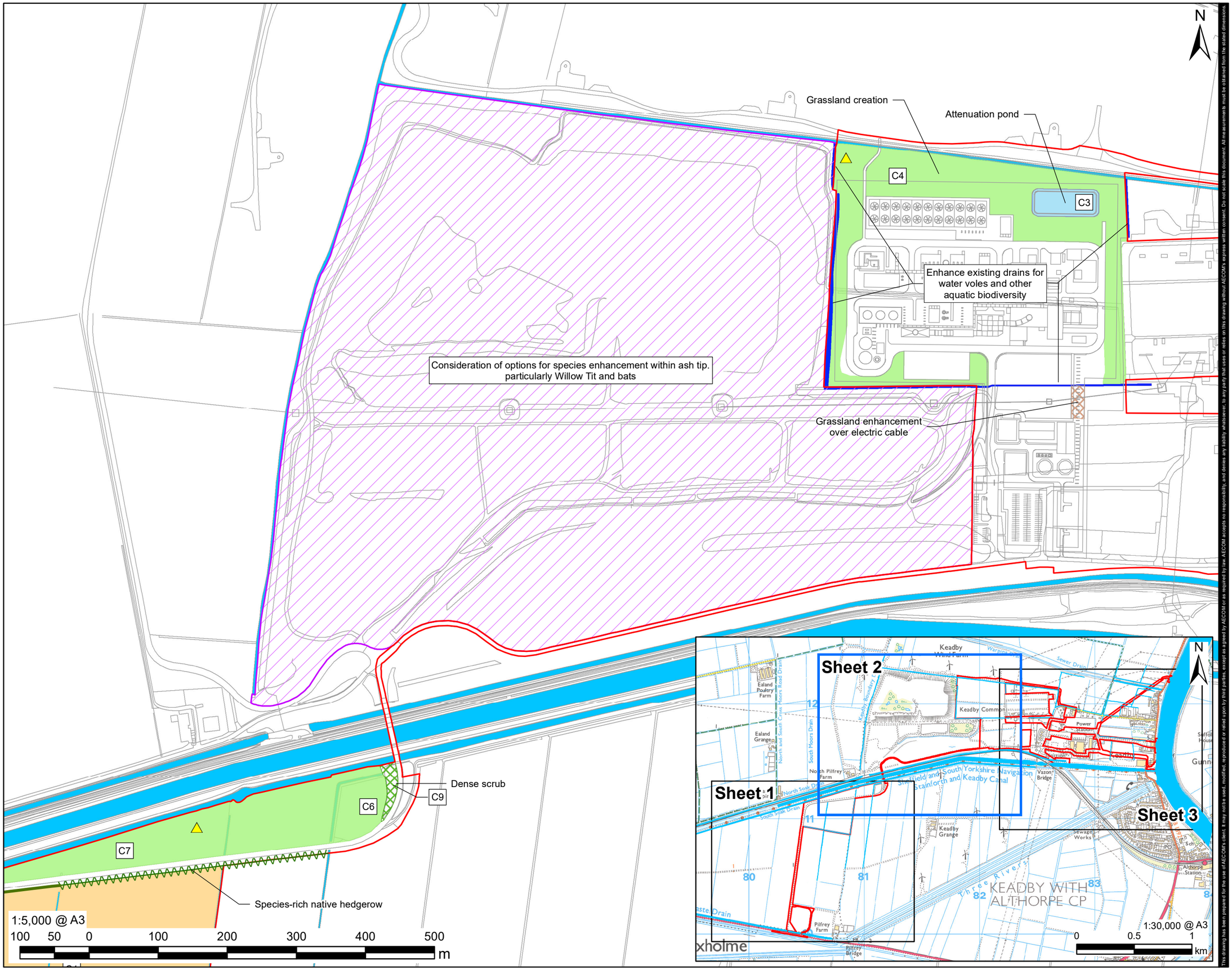
Revision: 02 Drawn: JW Checked: CA Approved: HN Date: 05/04/2022



AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

APPLICANT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

- The Order Limits
- Keadby Ash Tip
- Running Water
- Attenuation Pond
- Enhancement of Drains
- Grassland Creation
- Grassland Enhancement Over Electric Cable
- Proposed Dense Scrub
- Reinstated Arable Fields
- Proposed Species-Rich Native Hedgerow
- Retained Existing Hedgerow
- Indicative Locations for Barn Owl Towers

NOTES

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order Regulation 5(2)(o) - Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009

ISSUE PURPOSE

DCO APPLICATION

PROJECT NUMBER

60625943

SHEET TITLE

Landscaping and Biodiversity Management and Enhancement Plan
Sheet 2 of 3

SHEET NUMBER

Application Document Ref. 5.10

Revision: 02 Drawn: JW Checked: CA Approved: HN Date: 05/04/2022

Filename: K:\07 CAD & GIS\02_Maps\DCO_Update_2022_Plans\K_DCO_Doc_5_10_LandscapeBioManageEnhancePlan_A3_20220331_R02.mxd

Grassland creation and enhancement

Replacement tree plantings

C5

C2

C1

Infill native plantation

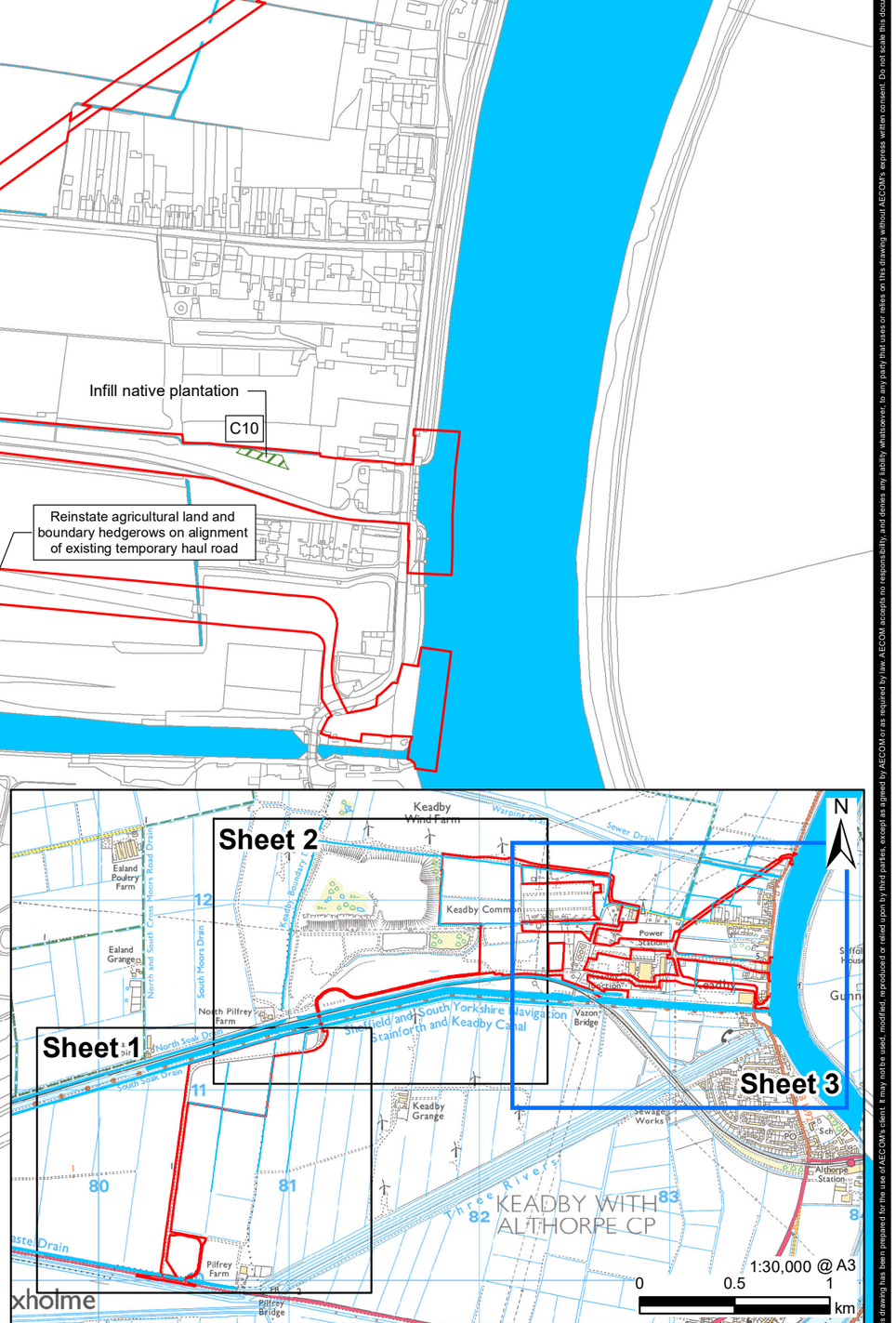
C10

Reinstate agricultural land and boundary hedgerows on alignment of existing temporary haul road

Proposed marginal plantings in canal

1:5,000 @ A3

100 50 0 100 200 300 400 500 m



N

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

APPLICANT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

- The Order Limits
- Running Water
- Attenuation Pond
- Broadleaved Plantation Woodland
- Enhancement of Drains
- Grassland Creation
- Grassland Creation and Enhancement
- Marginal Plantings in Canal
- Replacement Tree Plantings
- Proposed Broadleaved

NOTES

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The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order Regulation 5(2)(o) - Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009

ISSUE PURPOSE

DCO APPLICATION

PROJECT NUMBER

60625943

SHEET TITLE

Landscaping and Biodiversity Management and Enhancement Plan
Sheet 3 of 3

SHEET NUMBER

Application Document Ref. 5.10

APPENDIX A SEED MIXTURES

A.1.1 EM4 Meadow Mixture for Clay Soils

% Contribution	Common name	Latin name
0.6	Yarrow	*Achillea millefolium*
4.5	Common knapweed	*Centaurea nigra*
0.5	Meadowsweet	*Filipendula ulmaria*
0.2	Lady's bedstraw	*Galium verum*
0.4	Meadow crane's-bill	*Geranium pratense*
0.2	Rough hawkbit	*Leontodon hispidus*
4	Oxeye daisy	*Leucanthemum vulgare*
0.3	Birdsfoot trefoil	*Lotus corniculatus*
0.4	Cowslip	*Primula veris*
4.4	Selfheal	*Prunella vulgaris*
0.5	Meadow buttercup	*Ranunculus acris*
0.8	Yellow rattle	*Rhinanthus minor*
1.2	Common sorrel	*Rumex acetosa*
0.5	Great burnet	*Sanguisorba officinalis*
0.4	Pepper saxifrage	*Silaum silaus*
0.1	Devil's-bit scabious	*Succisa pratensis*
1	Tufted vetch	*Vicia cracca*
10	Common bent	*Agrostis capillaris*
1	Meadow foxtail)	*Alopecurus pratensis*
3	Sweet vernal-grass	*Anthoxanthum odoratum*
1	Quaking grass	*Briza media*

% Contribution	Common name	Latin name
26	Crested dogstail	*Cynosurus cristatus*
24	Slender-creeping red-fescue	*Festuca rubra*
1	Meadow barley	*Hordeum secalinum*
4	Smaller cat's-tail	*Phleum bertolonii*
10	Smooth-stalked meadow-grass	*Poa pratensis*

APPENDIX B BARN OWL TOWER DESIGN PARAMETERS

Barn Owl Trust
Waterleat, Ashburton
Devon TQ13 7HU
[redacted]

Pole-box Design

An outdoor Barn Owl nestbox suitable for erection on a large pole

LEAFLET No 50

Reg. Charity No 299 835

This leaflet describes how to make a Barn Owl nestbox suitable for erection on a large telegraph pole. The information includes plans, dimensions, materials, safety advice and erection tips.

Please note:

Nestboxes in buildings are generally the best option, followed by nestboxes in trees. Pole boxes are usually only erected where these options are not available. Nestboxes should never be erected on operational telegraph/electricity poles and erecting your own telegraph pole is expensive. Building and erecting a pole nestbox is a lot of work so before deciding to proceed make sure there is no alternative. See *Nestboxes for use in Barns & Other Buildings* (leaflet no. 3) and *Nestboxes for use on Trees* (leaflet no. 2).

Suitability of the area

The Barn Owl is not a woodland bird. In the UK, Barn Owls hunt mainly by flying over areas of rough grassland, ditch sides, young tree plantations etc. that support a high population of small mammals. In areas with an abundance of food but a shortage of suitable sites, nestboxes can be of great benefit. They should always be placed in areas with some good Barn Owl habitat or they are unlikely to be used. See *Habitat Management* (leaflet no. 1)

Selecting a suitable pole

A pole box is big and heavy and cannot be adequately supported by a thin or flexible pole. A good pole will not only support the box for many years but will also be strong enough to take the weight of someone climbing a ladder leaned against it during inspection or clearing out. Most proper telegraph or electricity poles are suitable and just need to be cut to the right length.

You should be aiming for an erection height over 4 metres above ground level using a substantial pole of not less than 150mm diameter and 6 metres long (1.5m underground and 4.5m in height). In areas where climbing nest-predators are a problem (such as Beech Martens in mainland Europe) position the pole away from buildings or trees and wrap a 1.5m section of the pole with thin aluminium or other very slippery material.

Pole-box construction

The basic box should be built using exterior grade rot-resistant or Tanalith E treated sheet material. The Barn Owl Trust uses 12mm tanalised ($^1/_2$") softwood ply, 25 x 50mm (2" x 1") tanalised batten and 30mm (1¼") rust resistant screws. There's also a small amount of 50 x 50mm timber and a piece of 18mm ply used in this design. Please avoid using hardwood ply, unless it is stamped "FSC Approved".

You may use any type of wood preservative on the box where tanalised (CCA-treated) ply is not available. The preservative should be applied to all component parts before the box is assembled so that all the edges are properly treated. Make sure the treated wood is dry before you assemble the box. During construction a waterproof sealant (such as EVER BUILD – WEATHER MATE) should be applied to all the wood joints to increase weather protection. If you need proof that this is necessary, try leaving your box under a sprinkler for a few hours and then look inside it.

Although tanalised timber is very rot-proof it's not very waterproof so the roof sheets should also be treated with Creosote or some other water-resistant preservative. The apex should be covered with a strip of aluminium or copper. The front, back and sides **MUST** overhang the floor of the box and as an extra precaution a large drainage hole (20mm - ¾" - diameter) should be drilled in each corner of the floor of the box.

All the dimensions are given as a guide and variations of + or - 10% are quite acceptable. The box must have a large access panel to enable nest debris to be cleared out periodically.

You can see a cutting plan and watch a slideshow of a pole-box being constructed on our website www.barnowltrust.org.uk

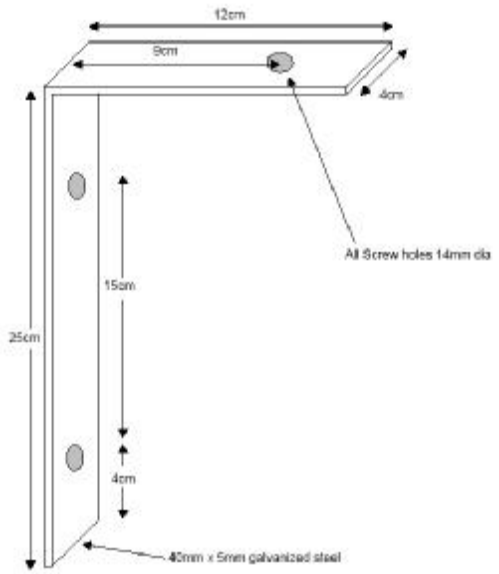
Siting the pole-box

Time spent in reconnaissance is seldom wasted. Please avoid siting your box within 1km (½ mile) of a dual-carriageway, motorway or similar modern road because of the high risk of road mortality. Nestboxes placed in a patch or strip of good (rough grassland) habitat are likely to be discovered more quickly as are boxes placed at existing roost sites. However, neither of these factors is essential.

The box should face open ground so that the main entrance hole is obvious to a passing owl. Don't hide it between big trees or tall buildings – if an entrance can't be seen easily the box is less likely to be discovered. Try to avoid facing the box towards prevailing wind and rain. Generally this means avoiding the west or south-west. The ridge of the roof should lie north-south or northwest-southeast.

The box will need to be cleaned out in future so think about where the ladder could stand and position the box so that this can be done safely.

POLE-BOX BRACKET DIMENSIONS



Erecting the box

By far the simplest and safest option is to attach the box to the pole before the pole is erected. If the pole has already been erected you may consider the use of tower scaffolding or a "cherry-picker" hydraulic platform. It is possible to erect a pole-box (on a pole that's already up) without using any machinery. However, a pole-box is heavy and awkward to lift by hand and the use of ladders is potentially dangerous. The Barn Owl Trust has placed pole-boxes onto previously-erected poles on numerous occasions with a team of three people using three ladders but a detailed description of the method is beyond the scope of this leaflet. Heavy duty galvanised steel brackets, coach bolts, and coach screws are used to secure the box to the pole.

The most important thing when erecting the box is your own safety (for which you are responsible), the safety of your helpers, and the safety of anyone going up to the box in future years. Make sure you carry out a detailed assessment of the risks associated with whatever method you choose and do not attempt to erect a pole-box when working alone!

Each half of the exercise platform should be slid onto the box after erection and retained by screwing through the two outer battens. To facilitate this the box has ladder rests on both sides as well as below the inspection hatch.

Important advantages of this pole-box design

The nestbox described in this leaflet is very deep which makes it almost impossible for the young to emerge prematurely. This reduces the chances of nestlings falling from the box and dying as a result of neglect or predation. By the time a young Barn Owl is big and strong enough to get out of the box it will soon be fully fledged. The design also provides emerging young with a very generous exercise platform enabling them to do lots of wing-flapping before their first flight. They can even get onto the roof of the box and safely back inside before they are able to fly.

The combination of box depth and safe exercise area means that when a young owl leaves the box for the first time it stands a very good chance of being able to fly up and get back inside. This period of returning to the box is important for their survival. Boxes with low entrance holes allow young to leave the box before they are big or strong enough to fly back up again. Young on the ground are generally ignored by the adults and either starve or are predated. Whereas young emerging from a tree-mounted nestbox stand some chance of being able to climb back up, a pole box does not allow the same possibility.

This design has other important features and detailed criteria for the evaluation of Barn Owl nestbox designs may be found at:
www.barnowltrust.org.uk/infopage.html?Id=231

Clearing out the box

As the box fills up with nest debris its effective depth is reduced and so it gradually becomes less safe for emerging young. After four or five broods of young have been produced (normally after about four years) the nest debris should be removed. Boxes used by Jackdaws will fill rapidly with sticks and should be

cleared out every year. When clearing out nest debris it is advisable to wear gloves and a dust mask. It's usually best to clear out nestboxes in November, December or January (but please try to avoid flushing birds out during severe weather conditions). Under the Wildlife and Countryside Act 1981, it is an offence to disturb breeding Barn Owls.

Safety tips

Before erecting your nestbox take time to consider the hazards you might face and what steps you could take to minimise the risks. Hazards might include: an injury at a remote location, falling from a ladder, injury from heavy lifting, dropping a nestbox onto another person, or poor positioning of a box resulting in additional hazards for anyone monitoring the box at a later date. The following are examples of precautions you should take to reduce the risks.

1 Don't work alone. If erecting a nestbox at an isolated site, let someone know where you are going and when you expect to be back before you set off. Carry a mobile phone if you have one.

2 Time spent in reconnaissance and preparation is seldom wasted. Never lift a box up into position until all preparatory work is complete. Double-check your measurements to confirm that the box will fit.

3 Ensure that any ladder you use is secure before climbing it. If possible tie it off at the top and bottom.

4 Avoid over-reaching - never attempt to carry out any task up a ladder if you cannot reach comfortably.

5 When planning how to position, support and fix a nestbox, try to create a situation where the box can rest in position without being held. This will allow you to have both hands free to fix it safely.

6 If carrying a nestbox up a ladder, ensure that it is kept low relative to your body (ideally not above waist height). This will keep your centre of gravity down. Try to keep the box in front of you or to the side - never hold a nestbox behind or above you.

7 You are responsible for your own safety - assess all the risks and be careful.

Please let us know when your box is occupied.

Good Luck!

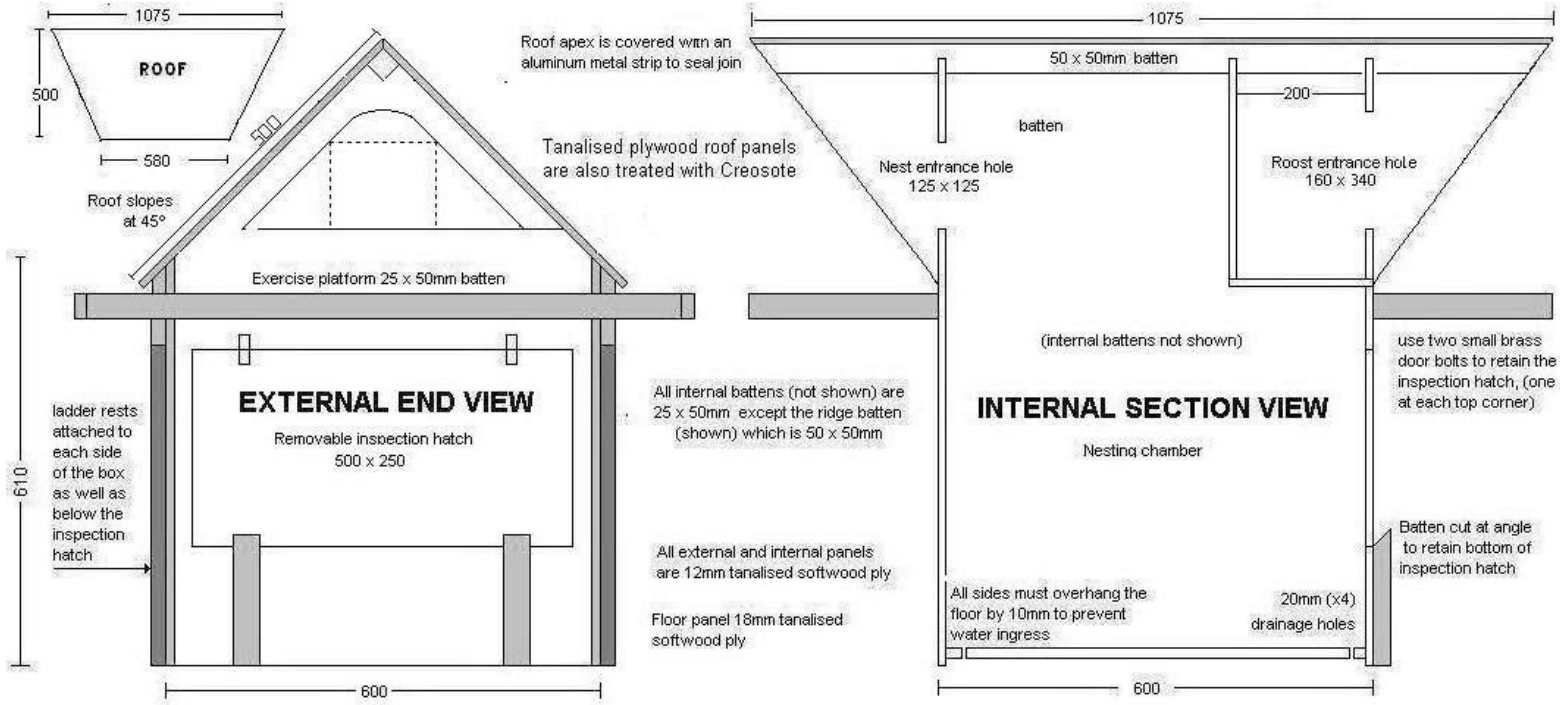
The Barn Owl Trust is a registered charity dedicated to the conservation of the Barn Owl and its environment. You can become a **Friend of the Barn Owl Trust** and support our work by making a regular donation. **Friends** receive our bi-annual magazine Feedback, our Annual Report and an enamel pin badge.

The Trust provides a wide range of free leaflets on Barn Owl related matters. For details of these and further information about the Trust and its work, please write including a large SAE to:

Barn Owl Trust
Waterleat
Ashburton
Devon
TQ13 7HU

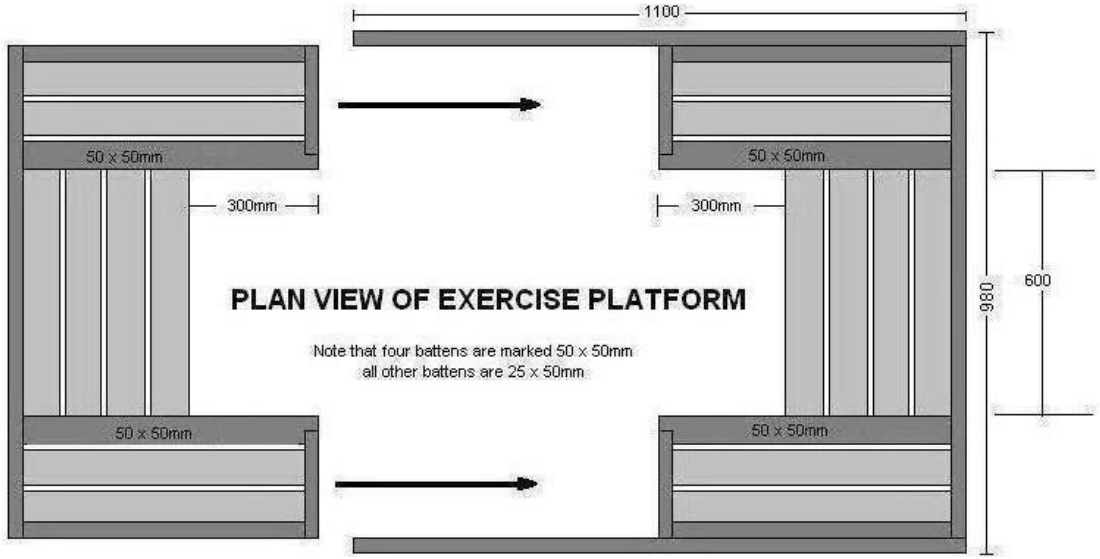
[redacted]

Leaflet No. 50—Pole-box design—an outdoor Barn Owl nestbox suitable for erection on a large pole



BARN OWL TRUST POLE BOX DESIGN.

Photographs of this box under construction may be viewed at www.barnowltrust.org.uk



The platform is made in two parts. After the box has been erected the platform halves simply slide onto the box and the outer extended battens (already attached to one half of the platform) are screwed to the other half. To facilitate this, the box has ladder rests on both sides. Please note that the light grey shaded battens in this diagram are flat and level with the bottom of all the other timbers. This effectively gives the tray an edge that is easy for young birds to grip.

Drawing NOT to scale

all dimensions are millimetres

APPENDIX C MAINTENANCE REGIMES

C.1.1 The landscape and biodiversity management and enhancement area will be managed and maintained for 10 years, with a review after 5 years to potentially integrate the management and maintenance.

Landscape Element Type	Maintenance Year 1												Maintenance Years 2, 3 and 4												Maintenance Year 5 and ongoing (to be reviewed and amended as required)											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Low Maintenance Grassland																																				
Remove litter, rubbish and debris	■				■				■				■				■				■				■				■				■			
Spot-treat undesirable species				■		■			■							■		■			■							■		■			■			
Establishment cuts (may occur pre-practical completion)					■	■	■																													
Subsequent cuts																■		■		■								■		■		■				
Control emerging scrub								■												■												■				
Species Rich Grassland																																				
Remove litter, rubbish and debris	■				■				■				■				■				■				■				■				■			
Spot-treat undesirable species				■		■			■							■		■			■							■		■			■			
Establishment cuts (may occur pre-practical completion)					■	■	■																													
Subsequent cuts																■					■							■					■			
Removal of arisings					■	■	■									■					■							■					■			
Control emerging scrub								■												■												■				

Scrub Planting
Spot-treat undesirable species
Re-firm plants
Inspect and adjust stakes, guards and ties
Pruning
Control unwanted emerging scrub within plots
Watering (timing as required)
Remove litter, rubbish and debris
Replacement of failed/ failing plants
Remove guards

Monitoring and Inspection
Weed control inspection
Annual inspection of all planted areas to record failed or defective plants
Annual inspection of all bird and bat boxes
Monitoring of landscaped areas to assess species diversity and establishment
Annual condition assessment survey of grassland (Year 1, 3 and 5)

APPENDIX D BIODIVERSITY NET GAIN ASSESSMENT

CONTENTS

ANNEXES

1.0 INTRODUCTION

1.1 Overview

1.1.1 Biodiversity Net Gain (BNG) is an approach to development that intends to leave biodiversity in a better state than before. It encourages developers to provide an increase (in extent and/or quality) in appropriate natural habitat over and above that required to compensate for the habitat losses that would arise from the development concerned. In so doing, the BNG approach aims to assess the current loss of biodiversity through development and contribute to the restoration of ecological networks.

1.1.2 This BNG assessment has been prepared to measure and quantify, in a repeatable manner using an approved method, the impact of the Proposed Development on biodiversity and nature conservation. This assessment therefore complements and directly supports, and therefore should be read in conjunction with, the Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) (of which this appendix is part of). Further descriptive detail on the background to the Proposed Development is provided in:

- **Chapter 1**: Introduction (ES Volume I, Application Document Ref. 6.2.1, **APP-044**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 2**);
- **Chapter 3**: The Site and Surrounding Area (ES Volume I, Application Document Ref. 6.2.3, **APP-046**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 2**);
- **Chapter 4**: The Proposed Development (ES Volume I, Application Document Ref. 6.2.4, **APP-047**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 2**);
- **Chapter 5**: Construction Programme and Management (ES Volume I, Application Document Ref. 6.2.5, **APP-048**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 2**); and
- **Chapter 6**: Consideration of Alternatives (ES Volume I, Application Document Ref. 6.2.6, **APP-049**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 2**).

1.1.3 The final LBMEP will be delivered as a Requirement of the Development Consent Order (DCO) and is to be agreed with North Lincolnshire Council (NLC) once the detailed design has been completed. At this time, an update of the BNG assessment (i.e. this appendix) will also be presented to demonstrate that the approach and quantum of BNG, as set out in this report and the related LBMEP, remains consistent with that agreed at Examination.

1.2 Relevant Legislation and Planning Policy

1.2.1 The Environment Act 2021 mandates the need for new development to deliver 10% BNG and to maintain this for a period of at least 30 years. However, secondary legislation needs to be enacted before this requirement is legally enforceable for Nationally Significant Infrastructure Projects (NSIPs). Therefore, the government intends that the BNG requirement of the Act should apply across all terrestrial infrastructure projects, or terrestrial components of projects, accepted for examination by the Planning Inspectorate through the NSIP regime by November 2025. At this time, a minimum quantum of BNG will also apply and this has been set at 10%. Projects accepted for examination before the specified commencement date would not be required to deliver mandatory BNG, although they might deliver it in response to policy or voluntary commitments.

1.2.2 In relation to requirements under the Act, a standardised assessment method and calculation tool has also been mandated. This is known as Biodiversity Metric 3.0 (Natural England, 2021).

1.2.3 The current approved version of Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change, 2011) does not explicitly mandate BNG assessment, and instead only includes a requirement that applicants should show how the NSIP "*has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests*."

1.2.4 The emerging revision of Overarching NPS for Energy (EN-1) (Department for Business, Energy and Industrial Strategy, 2021) is likely to include specific requirements in relation to BNG, although it should be noted that the current draft text was published before the Environment Act 2021 was enacted. Paragraph 4.5.2 states "*although achieving biodiversity net gain is not an obligation for projects under the Planning Act 2008, energy NSIP proposals should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity where possible. Applicants are encouraged to use the most current version of the Defra biodiversity metric*[1] *to calculate their biodiversity baseline and inform their biodiversity net gain outcomes and to present this data as part of their application*."

1.2.5 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) addresses BNG in more general terms, encouraging net gains for biodiversity to be sought through planning policies and decisions. For example paragraph 180(d) states "*opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity*." Within the supplementary Planning Practice Guidance on the

[1] It should be noted that the wording here is erroneous given that at the time of publication this metric had been replaced by Biodiversity Metric 3.0 (Natural England, 2021)

natural environment, the government has further clarified that "*using a metric is a pragmatic way to calculate the impact of a development and the net gain that can be achieved*" in support of compliance with the NPPF.

1.2.6 North Lincolnshire Local Development Framework (LDF) Core Strategy (adopted 2011) (NLC, 2011) also addresses BNG in general terms. Policy CC17 states "*ensuring development seeks to produce a net gain in biodiversity by designing in wildlife, and ensuring any unavoidable impacts are appropriately mitigated for*" and "*… wildlife enhancements that contribute to the habitat restoration targets set out in the North Lincolnshire's Nature Map and in national, regional and local biodiversity action plans*." However, there is no applicable local planning policy that requires either delivery of a specific quantum of BNG, or the method through which BNG should be quantified and demonstrated.

1.2.7 The emerging North Lincolnshire New Local Plan (Preferred Options (Regulation 18) consultation draft, 2020) (NLC, 2020) is expected to strengthen the policy regime in relation to BNG. Draft policy DQE3p states that "*all schemes shall, as appropriate to their nature and scale, deliver a net gain in biodiversity*."

1.2.8 Draft policy DQE3p goes further by setting parameters for how this should be achieved in practice, specifically "*priority habitats, where practicable, should be retained, enhanced or created within the development site or suitable alternative habitats should be provided elsewhere*" and "*development proposals should create new habitats and links between habitats in line with Biodiversity Opportunity Mapping evidence to maintain a network of wildlife sites and corridors to minimise habitat fragmentation and provide opportunities for species to respond and adapt to climate change. Biodiversity offsetting will be used where net gain cannot be achieved within the site boundary*."

1.2.9 Other strategic guidance relevant to interpretation of the above requirements and development of the BNG strategy comprises:

- National Pollinator Strategy (Defra, 2014);
- Lincolnshire Local Biodiversity Action Plan (LBAP) (Lincolnshire Biodiversity Partnership, 2011); and
- National Character Area (NCA) Profile 39 (NE339): Humberhead Levels (Natural England, 2012).

1.3 Relevant BNG Assessment Guidance

1.3.1 This report has been prepared with reference to the following good practice guidance:

- The suite of BNG technical guidance and standards published to accompany Biodiversity Metric 3.0 (Natural England, 2021 (as last updated on 13 August 2021));

- BNG Report and Audit Templates published by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2021);
- BNG: Good practice principles for development published by CIEEM, Construction Industry Research and Information Association (CIRIA) & Institute of Environmental Management and Assessment (IEMA) (2016); and
- British Standard BS 8683: Process for designing and implementing biodiversity net gain – Specification (British Standards Institution, 2021).

2.0 METHODS

2.1 Overview of the Approach

2.1.1 BNG assessment involves making a comparison between the biodiversity value of habitats present within a defined site boundary (in this case the Order Limits as shown on **Figure 1**) prior to implementation of the Proposed Development (the 'baseline') and the predicted biodiversity value of habitats following completion of the Proposed Development and associated commitments under the LBMEP ('post-development'). The comparison is made in terms of 'biodiversity units', with a 'biodiversity metric' providing the mechanism to allow biodiversity values to be calculated and compared.

2.1.2 Biodiversity Metric 3.0 (Natural England, 2021), the current iteration of the metric that will be mandated for use under the Environment Act 2021 when implemented for NSIP in 2025, calculates the overall loss or gain of biodiversity by assessing the distinctiveness (i.e. type of habitat and its relative value), condition, extent, and strategic significance of the habitats present pre- and post-development. Distinctiveness is assigned automatically by the metric based on habitat type, but the remaining three parameters need to be entered by the assessor. The approach for assessing condition and assigning strategic significance is described below in Sections 2.3 to 2.5.

2.1.3 In relation to the post-development baseline, the metric also includes weightings based on the difficulty of the proposed intervention, how long after the original habitat loss the intervention will take place (i.e. the delay), and the time it would take for the proposed interventions to achieve target condition. The first and last of these are again assigned automatically by the metric, but the delay needs to be entered manually based on a realistic precautionary assessment of likely timelines. An indicative construction programmes is provided in ES **Chapter 5**: Construction Programme and Management (Application Document Ref. 6.2.5, **APP-048**) and indicates that construction (including site clearance) will take 3 to 4 years and therefore that soft landscaping works are likely to be undertaken 4 years after the original habitat loss to the Proposed Development (a 4-year delay) at a comparable time as commissioning and testing prior to first commercial operation.

2.1.4 To achieve BNG, the biodiversity unit score must have a post-intervention score higher than the baseline score. When calculating the post-intervention biodiversity units, the metric includes a series of standard 'risk multipliers' to account for the inherent risk of creating and restoring habitats, and the time taken to establish habitats. The risk multipliers have the effect of reducing the value of the proposed habitats, which means larger areas, and habitats of higher distinctiveness and/ or condition are required to achieve net gain.

2.1.5 The metric assesses and generates separate outputs for area-based habitats (measured in habitat units) and linear habitats, including hedgerows (measured in hedgerow units) and watercourses (measured in river units).

2.1.6 An Excel calculation tool (workbook) has been provided as part of the package of documents comprising Biodiversity Metric 3.0 and this has been utilised to make the BNG assessment.

2.2 Baseline Data Gathering

2.2.1 A Phase 1 Habitat survey was undertaken in accordance with the standard survey method (Joint Nature Conservation Committee, 2016) as described in **Appendix 11C**: Preliminary Ecological Appraisal Report (ES Volume II, Application Document Ref. 6.3.14, **APP-078**) including in **Appendix 11C:** Preliminary Ecological Appraisal Report of the ES Addendum (**Document Ref 6.2.11 Rev 2)** to record the area-based and linear habitats present and to collect data to permit the baseline condition of these habitats to be assessed. However, the approach for rivers differed from that for other habitats (including ditches), as explained in Section 2.3.

2.2.2 Phase 1 Habitat survey is a standard method of environmental audit. It involves categorising different habitat types and habitat features within a survey area.

2.2.3 Each discrete habitat parcel was appraised to determine the baseline habitat condition (which is a proxy for habitat value) for entry into Biodiversity Metric 3.0, or if this was not possible (e.g. in the case of unaffected ditches located on third party land) a precautionary (realistic best case) condition was applied. The Site Condition Assessment was made within reference to the criteria published by Natural England with Biodiversity Metric 3.0 (Natural England, 2021). Using these criteria each habitat was typically assigned either Poor, Moderate or Good condition, although it is also possible for these scores to be upgraded or downgraded (depending on the starting point) using professional judgement to the categories Fairly Poor or Fairly Good. Where this has been done, the reasons for this are provided in this report or the Excel workbook (**Annex B**).

2.2.4 The baseline site condition scores are the basis for determining whether meaningful habitat enhancement can be achieved, the parameters for that enhancement (i.e. what needs to be achieved to boost the habitat condition to a higher level), and what condition score can reasonably be achieved post-intervention.

2.2.5 Biodiversity Metric 3.0 uses a modified version of the UK Habitat Classification (UKHab), so the Phase 1 habitat survey data collected by AECOM was translated after the survey into its UKHab equivalent with reference to the conversion guidance contained within the metric. The relevant UKHab habitats are shown on the Habitat Baseline Plan (**Figure 1**).

2.3 River and Ditch Habitats

2.3.1 Assessment requirements in relation to rivers (including streams and canals but not wet ditches) diverge from the approach for other habitats (as summarised above in Section 2.2).

2.3.2 Assessment of condition is based on the extent and diversity of observed physical features in the channel and the adjacent riparian zone (including the physical structure of vegetation) as well as the extent and types of any human modifications. The physical state of a river reach is a useful proxy for determining overall riverine ecological quality but needs to be attuned to the type of river under consideration.

2.3.3 In line with current guidance (Natural England, 2021), habitat categorisation, associated distinctiveness and condition scores requires a desk study. The purpose is to identify the river habitats present within the Order Limits using the 'Discovering Priority Habitat in England' river data map (Freshwater Biological Association, 2022) and to inform the categorisation of the river habitats present and the distinctiveness and condition of these river habitats.

2.3.4 If desk study data are not available, then a Modular River Physical (MoRPh) survey may be needed to assess the condition of rivers. However, condition can also be assigned retrospectively using suitable data collected during other aquatic ecology and habitat surveys and employing a precautionary approach where certain parameters are not known (as would be the case during a MoRPh survey where access is constrained or unsafe).

2.3.5 The exception to the foregoing approach is ditches, as the method for condition assessment is the same as for area-based habitats. Ditches located outside areas of agreed land access (i.e. within areas unaffected by the Proposed Development, such as ditches crossing over the alignment of the Water Discharge Corridor) were assigned a precautionary (likely best case) condition of 'Moderate'. There was no need to assess the condition of culverts, where these occur, as the heavily modified nature of these means that they assigned poor condition by default.

2.3.6 Impacts on river habitats are assessed in terms of 'encroachment' by development. Encroachment is defined as "*a reduction in the quantity/ quality and 'use' of available habitat that forms a specific ecological function for riparian or aquatic specialist species. Whereby, 'use' is defined as the ability of a species to: commute, forage, rest/ dwell, or access as part of its life cycle between aquatic and terrestrial phases*" (Natural England, 2021). Therefore, works within the riparian zone of a river within a pre-existing area of hardstanding would not be riparian encroachment, as there would be no impact on quantity or quality of habitat or its suitability for use by species.

2.3.7 The relevant rivers and ditches are shown on the River Baseline Plan (**Figure 2**).

2.4 Post Development Data

2.4.1 The Indicative Landscape and Biodiversity Plan (**Application Document Ref. 4.15**, also shown as Figure 1 of the LBMEP) has been used to determine the extent and type of habitats to be retained and created post-development.

2.4.2 The habitats shown on the Indicative Landscape and Biodiversity Plan have been digitised into the Geographic Information System (GIS) so that the area and length measurements could be produced for habitat losses, the affected habitats that would be reinstated, and other unaffected areas to be enhanced.

2.4.3 The post-development habitats proposed have been assigned to the intended UKHab categories. Target condition scores for the proposed habitats are considered to be realistic and therefore suitably precautionary. No new habitats are proposed that require novel approaches, and instead all can be created using well-established techniques and based on a good understanding of typical management requirements and outcomes.

2.5 Strategic Significance

2.5.1 All baseline and post-development habitat parcels must be assigned a strategic significance score, and this relates to whether the site as a whole or individual component habitats have been identified as significant for nature. Recognising strategic significance therefore gives extra value to habitats that are in optimal locations, or are of a type, that meet local objectives for biodiversity.

2.5.2 Application of strategic significance requires that a score be assigned to each habitat parcel. The options for scoring each habitat parcel are:

- High - within an area formally identified in a local strategy, plan or policy.
- Medium - location ecologically desirable, but not identified in a local strategy, plan or policy.
- Low - not identified in a local strategy, plan or policy OR no strategy or plan is in place in the area.

2.5.3 The ‘within an area formally identified in a local strategy’ scoring option should only be selected for those specific habitats identified as being geographically important within relevant local strategies. For example, if the survey site contains a mixture of habitats and is within an area identified as strategically important for lowland calcareous grassland it is only the lowland calcareous grassland that would be recorded as ‘within an area formally identified in a local strategy.’ However, when a local strategy identifies an area as ecologically significant generically, such as a Local Site or strategic ecological corridor, all habitats occurring within that area would be identified as ‘within an area formally identified in a local strategy.’

2.5.4 To determine the strategic significance of sites and habitats, the local plans, strategy and policy documents detailed in Table 1 were reviewed.

Table 1: Plans and policy informing assessment of strategic significance

Plan	Relevant habitats	Applicable policy or guidance
Lincolnshire BAP, 3rd Edition	Open Mosaic Habitat Rivers, canals and drains (but not minor field ditches) Acid grassland Gardens and allotments Other national priority habitats	Not applicable
North Lincolnshire LDF Core Strategy June 2011	Habitats within nature conservation designations Hedgerows Other national priority habitats	CS16
North Lincolnshire Local Plan Publication Plan October 2021	Habitats within nature conservation designations Habitats meeting LWS criteria (encompassing Keadby Ash Tip) Hedgerows Waterbodies Other national priority habitats Habitats identified as Green Infrastructure Habitats covered by Biodiversity Opportunity Mapping	DQE1, DQE3, DQ12
North Lincolnshire Local Plan May 2003 saved policies	Habitats within nature conservation designations Hedgerows Woodland	LC1, LC2, LC3, LC4, LC12
NCA Profile: 39 Humberhead Levels	Wetland Ditches and drains (but not minor field ditches)	SEO1, SEO2

2.6 Approach to Identification of Suitable Habitat Interventions

2.6.1 Suitable habitat interventions have been considered with reference to the factors influencing the baseline habitat condition, as determined through application of the prescribed Site Condition Assessment criteria during the baseline site surveys.

2.6.2 Good practice guidance (Natural England, 2021) emphasises that 'measures to enhance existing habitats must provide a significant and demonstrable uplift in distinctiveness and/or condition to record additional biodiversity units.' When investigating options for meaningful habitat enhancement to uplift condition, two types of habitat intervention have been considered. These are:

- Habitat management interventions to improve the condition of existing habitats.
- Habitat trading interventions to replace an existing habitat with one of higher distinctiveness.

2.6.3 When considering habitat management interventions, due consideration has also been to whether the possible interventions are realistic (in terms of the site conditions and timeframe for delivery of the target condition), practicable (in terms of deliverability by a landscape contractor), and honest. Woodlands are particularly pertinent to these considerations, as the Site Condition Assessment criteria for woodlands strongly link baseline condition with characteristics related to age and naturalness. Therefore, as example, where a woodland is poorly performing against the criteria with reference to a lack of natural regeneration, this cannot be rectified by new plantings. As further examples in relation to this point, introduction of woodland ground flora, while beneficial, cannot be considered to create a woodland National Vegetation Classification (NVC) community where this did not exist previously so the woodland cannot be scored as if it is a semi-natural woodland. Planting of flora that in other circumstances could be considered ancient woodland indicator species cannot be used to score a secondary woodland as if it is ancient woodland or lowland mixed deciduous woodland (priority habitat).

2.6.4 Biodiversity Metric 3.0 has been constructed to permit some habitat trading options and to prohibit others. This generally relates to the distinctiveness of the baseline habitat relative to that proposed to replace it, with only trading of low and medium distinctiveness habitats permitted. Where habitat trading is permissible, options have again only been put forward where this is realistic, practicable, and honest.

2.6.5 An example of a permissible habitat trade would be the conversion of 'modified grassland' to 'other neutral grassland'. This is an option that is realistic and practicable in terms of timeframes for delivery, availability of suitable management techniques (e.g. mowing, reseeding etc), and available information on the likelihood of success (i.e. difficulty). An example of an unacceptable habitat trade within Biodiversity Metric 3.0 would be loss of

lowland calcareous grassland (a high distinctiveness habitat) to create a biodiversity pond. Similar trading rules apply in relation to habitat compensation and at times the metric can be a blunt instrument that merits further consideration and review. For example, the metric does not permit creation of species-rich grassland to compensate for losses of Open Mosaic Habitats (OMH), even though the former is a recognised component of OMH. However, the metric does permit consideration of such solutions offline as 'bespoke mitigation packages', provided BNG is otherwise achievable. Where bespoke mitigation packages have been relied on, these are clearly identified and have been discussed and agreed with relevant stakeholders.

2.6.6 Another important consideration relates to the principal of 'additionality'. Interventions proposed to achieve BNG must make a new contribution to nature conservation i.e. a conservation outcome that would not have occurred without the intervention. For example, ongoing favourable management of grassland habitats would not offer anything additional if suitable regimes are already in place and these regimes would otherwise have continued.

2.7 Limitations, Assumptions and Constraints

2.7.1 There are no limitations to the field surveys completed for this study. The surveys were completed at a suitable time of year for the correct identification of habitats and the appraisal of their relative condition (Joint Nature Conservation Committee, 2016).

2.7.2 All habitats were mapped and measured in ArcGIS using appropriate base mapping (Ordnance Survey Mastermap). Therefore, while all the habitat areas calculated are approximations they are as accurate as practicable. The total habitat area (hectares) entered into the Metric is the extent of terrestrial habitats within the Order Limits and therefore omits the area of land covered by rivers (which are reported based on their linear extent in kilometres). Therefore the area stated is slightly smaller than the land area covered by the Order Limits.

2.7.3 The current Site Condition Assessment criteria (Natural England, 2021), while much improved relative to the previous iteration, retain some inconsistencies. One inconsistency relevant to this report relates to assessment of open space within woodlands. In simple terms, the current open space criterion advises that woodlands in optimal condition will have open space representing 10-20% of the total woodland area, and that increasing increments of open space over this indicates declining woodland condition. However, the criterion does not explain how to score woodlands which are completely lacking in open space (a common scenario within recent plantations), although the inference would also be that such woodland is not in optimal condition and should therefore be scored less favourably than woodland with 10-20% open space. This is the approach taken in this assessment, as closed canopy woodland is generally not optimal for biodiversity. This is not considered a limitation given the woodlands concerned are all of relatively young age and this approach would not alter the conclusions of the Site Condition Assessment.

2.7.4 The assessment is based on the indicative design and this may be subject to further change prior to submission of the detailed design. However, the assessment demonstrates that BNG is feasible and securable, and the committed level of BNG would need to be achieved later even if there is a need to amend the configuration of the habitats that will be created to achieve this. The assessment will be updated to support agreement of the final LBMEP the provision of which will be a Requirement of the DCO. If the layout of the proposed new habitats needs to be amended at detailed design, then the aim will be to achieve comparable habitat connectiveness/ cohesiveness.

2.7.5 A conservative approach has been used within the calculations to account for uncertainties regarding the final layout for the Proposed Development. The current assessment is therefore precautionary (i.e. worst-case, both in terms of losses and in the gains achievable) and there are a number of reasons why the land required to achieve the committed gain and its location may change later. Specifically:

- the current assessment takes a worst-case position and assumes that all land within the Proposed PCC Site that has not been allocated for biodiversity enhancement would be permanently lost to buildings and hard landscaping. This is overly precautionary, but it is a necessary assumption until the final site layout is fixed following detailed design.
- the potential condition (a quality indicator) achievable for all new habitats is precautionary and likely overly so. So, as example of this, all new grasslands have been assumed to achieve 'moderate' condition even though 'fairly good' condition is realistically achievable. Similarly, the attenuation pond is assumed to achieve 'poor' condition even though a higher condition might be achievable later after consideration of the design options available (but noting the preference for a concrete liner).
- realistic precautionary timeframes are set within the metric for the committed habitat creation i.e. up to ten years to achieve target condition of grassland habitats. This represents a typical management period when establishing new habitats. In reality, given the proposed management regimes, measurable biodiversity gains for wildlife (e.g. invertebrates) from the new grasslands can be expected by Year 5 and before the final target condition is achieved for the habitat itself.
- no claims are made that the new habitats would represent priority habitats. Instead, the only aim is to achieve a genuine enhancement. So, for example, the existing poor quality 'modified grasslands' will be replaced with habitat more typical of favourably managed semi-natural grasslands i.e. 'other neutral grassland'. The management regimes necessary to achieve this are set out in the LBMEP, and the standard guidance (Natural England, 2021) advises that such habitat has a 'low difficulty of creation'. Given this it is reasonable to assume that the committed habitats can and will be delivered.

2.7.6 The vegetation cleared for construction of the existing AIL Route for Keadby 2 Power Station does not represent a habitat loss attributable to the Proposed Development but there will still need to be habitat reinstatement after construction. The responsibility and timescales for delivering this habitat reinstatement are currently controlled by conditions on planning permission PA/2019/1595 as varied by planning permission PA/2021/188. Under the draft DCO, it is proposed that these permissions will effectively be extended, and the matters controlled by condition will be secured by equivalently worded requirements in Schedule 2 of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**]. Given the existing requirements, restoration of the land affected by the existing AIL Route cannot contribute to BNG for the Proposed Development as it does not represent additionality. Therefore, the existing haul road has been treated as no change within the metric.

2.7.7 Assumptions and professional judgement were applied for all rivers and ditches relevant to the Proposed Development where field surveys were not undertaken (because the relevant land areas whilst in the Order Limits are not required for and would be unaffected by the Proposed Development). A similar approach was taken where access was not feasible and/or safe.

2.7.8 The river assessor visited the Stainforth and Keadby Canal River to appraise the affected reach, however the Hatfield Waste Drain (**Figure 2**) was not subject to a MoRPh survey as access to the channel was poor given the steep bank profile and proximity to a major road. Sufficient data to assess condition and complete the MoRPh survey proforma was available for the latter from prior water vole surveys (**Appendix 11F:** Riparian Mammal Survey Report of ES Volume II, Application Document Ref 6.3.17, [**APP-081]**), aquatic ecology surveys (**Appendix 11G:** Aquatic Ecology Survey Report of ES Volume II, Application Document Ref 6.3.18, [**APP-082**]), the Water Framework Directive Assessment Report (Application Document Ref 6.3.21, **APP-085**), current aerial imagery and Google Streetview.

2.7.9 Ditches 6 to 20 and ditch 22 were assigned a habitat condition score retrospectively using a reasonable precautionary approach and professional judgement to prevent under-estimating the value of the baseline habitat.

2.7.10 A ‘worse-case’ scenario has been assessed for the cooling water intake i.e. it has been assumed that the Canal Water Abstraction Option will be selected necessitating construction of a structure on the Stainforth and Keadby Canal. The River Water Abstraction Option has been discounted as, even if selected, no new construction works are proposed other than installation of an eel screen within the existing built footprint of the existing structure.

2.7.11 Consistent with the published guidance (Natural England, 2021) it is emphasised that Biodiversity Metric 3.0 uses habitats as a proxy for biodiversity and therefore represents a simplification of the ‘real world’. Furthermore, while the scoring of habitats is informed by ecological reasoning and the available evidence, the outputs of biodiversity unit calculations are not scientifically

precise or absolute values. The metric and its outputs should therefore be interpreted, alongside ecological expertise and common sense, as an element of the evidence that informs plans and decisions. The metric is not a total solution to biodiversity decisions. The metric, for example, helps determine how much new or restored habitat is needed to compensate for a loss of habitat, but it does not tell you the appropriate composition of plant species to use.

3.0 BASELINE CONDITIONS

3.1 Relevant Habitats

3.1.1 A Habitat Baseline Plan is provided as **Figure 1.** This codes the relevant habitats based on the UKHab classification used in the metric but is otherwise based on the information originally presented on the Phase 1 Habitat Map included within **Appendix 11C**: Preliminary Ecological Appraisal Report (ES Volume II, Application Document Ref. 6. 3.14, **APP-078**) including **Appendix 11C** of the ES Addendum (**Document Ref 6.2.11 Rev 2)**.

3.1.2 The habitats that would be affected by permanent or temporary land-take for the Proposed Development (excluding the temporary habitat losses defined in Section 5.2) comprise:

- modified grasslands encompassing species-poor improved and poor semi-improved neutral grasslands (located at the Proposed PCC Site, construction laydown area 2c, and the Highway Improvements on the A18);
- other neutral grassland that is unmanaged and heavily invaded by brambles (located along the Additional AIL Route to the north of Keadby 1 Power Station);
- dense scrub comprising stands of mixed scrub and hawthorn or bramble dominated scrub (located respectively on the boundary of the Proposed PCC Site with the former Keadby Ash Tip, in the wayleave of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation), and the Additional AIL Route to the north of Keadby 2 Power Station);
- young semi-mature plantation woodland (located along the Additional AIL Route adjacent to Trent Road and Chapel Lane);
- ephemeral/ short perennial vegetation contributing to open mosaic habitats (OMH) (located on the south-west corner of the Proposed PCC Site where there is a minor overlap with the margin of the former Keadby Ash Tip);
- intensively managed arable farmland (located within areas proposed for temporary construction laydown);
- unvegetated disturbed bare ground (located within the temporary soil storage compound for Keadby 2 Power Station, part of the Proposed PCC Site);
- a minor field ditch (Drain 4 located within Proposed PCC Site);
- watercourses comprising the Hatfield Waste Drain (which is crossed by the existing Mabey Bridge which is to be replaced), and the Stainforth and Keadby Canal (within which the potential Canal Water Abstraction Option would be constructed); and

- existing area of hardstanding and other sealed surfaces (located at the Proposed PCC Site with land formerly used as laydown and car parking during construction of Keadby 2 Power Station).

3.1.3 Additional areas of land are to be utilised solely for purposes of landscape and biodiversity enhancement. These comprise:

- modified grasslands to be converted to other neutral grassland (located on road verges or in the retained areas of the small fields adjacent to the permanent access road off the A18, and retained vegetation within the Proposed PCC Site on the alignment of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation);
- modified grasslands to be converted to plantation woodland or scrub (located by Trent Road, North Pilfrey Bridge and Mabey Bridge);
- other neutral grassland that is unmanaged and heavily invaded by brambles (located to either side of the Additional AIL Route to the north of Keadby 1 Power Station);
- existing tarmacadam car park (sealed surface) to be broken out and replaced (located adjacent to the permanent access road off the A18); and
- minor ditches (located on the boundaries of the Proposed PCC Site).

3.2 Other Relevant Ecological Features

3.2.1 The following designations (Environmental Statement (ES) - Figure 11.1 and 11.2, **APP-121** and **APP-122**) coincide with the land required for the Proposed Development:

- Humber Estuary Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Ramsar site (which is the location of the potential River Water Abstraction Option) – this designation does not influence the deliverability of BNG. No likely significant effects are predicted should the River Trent be chosen as the cooling water supply, refer to **Chapter 11**: Biodiversity and Nature Conservation (ES Volume I, Application Document Ref. 6.2.11, **APP-054**) including **Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Application Document Ref. 6.2.11 Rev 2**) and the Habitats Regulations Assessment Appropriate Assessment Report - Rev 2 (**Application Document Ref. 5.12**, **[REP1-006]**).
- Stainforth and Keadby Canal Corridor Local Wildlife Site (LWS) (within which the potential Canal Water Abstraction Option would be constructed) – there is no marginal vegetation at the location of the potential water abstraction which coincides with a vertical reinforced bank and the existing water intake structure for Keadby 2 Power Station. Consequently, this designation is not considered to constrain the deliverability of BNG.

- Hatfield Waste Drain LWS (which is adjacent to but is unaffected by the Highway Improvements on the A18) – no habitat loss would occur within the boundary of the LWS, so the LWS has no bearing on the deliverability of BNG.
- Keadby Warping Drain LWS (which is on the alignment of the existing cooling water discharge corridor) – no habitat loss would occur within the boundary of the LWS, so the LWS has no bearing on the deliverability of BNG.

3.2.2 In addition, the following ecological features also have specific relevance to the BNG assessment:

- The former Keadby Ash Tip – while this is a site of high biodiversity importance (refer to **Appendix 11C** of ES Volume II, Application Document Ref. 6. 3.14, **APP-078)** including in **Appendix 11C:** Preliminary Ecological Appraisal Report of the ES Addendum (**Application Document Ref 6.2.11 Rev 2)**, the habitats of greatest nature conservation value are located at distance and would not be affected. The minor land take from a peripheral area would not compromise the biodiversity value of the former Keadby Ash Tip so this is not a substantive constraint to the deliverability of BNG. This point has been agreed with the relevant stakeholder (NLC).
- Habitats identified as Green Infrastructure and Biodiversity Opportunity areas on the Local Plan Policies Map - the relevant habitats are modified grasslands and a species-poor ditch, so inclusion of these habitats relates to the habitat linkages they provide rather than any specific nature conservation value of these habitats in isolation. As these habitats will benefit (see Section 2.5) from additional weighting within the metric, they are not perceived to have specific relevance to the ability to deliver BNG.
- Water vole – this proposed enhancement of ditches on the boundary of the PCC site is likely to benefit this species. As such, water vole is not a constraint to delivering BNG.

4.0 APPLICATION OF BNG GOOD PRACTICE PRINCIPLES

4.1.1 Ten good practice principles have been identified to provide a framework for achieving BNG (CIEEM, CIRIA & IEMA, 2016). A summary is provided below, see Table 2, to identify how each of these principles has been addressed when undertaking this BNG assessment and when developing the underpinning habitat restoration, creation and enhancement scheme detailed in the LBMEP.

Table 2: Review of the Proposed Development Against the BNG Good Practice Principles

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
Principle 1. Apply the Mitigation Hierarchy	Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.	Through the iterative design process, consideration was given to a range of design options. Decisions taken regarding the concept design of the Proposed Development were, where relevant and possible, informed by environmental appraisal and assessment work and by consultation with stakeholders. Care was taken to choose a site location of inherently low biodiversity value, and to avoid habitats of intrinsically higher value (the former Keadby Ash Tip). The approach to site selection and layout has been agreed with stakeholders.	**Chapter 6**: Consideration of Alternatives (Application Document Ref. 6.2, **APP-049**) including Volume I of the ES Addendum (**Application Document Ref 6.2.1 – 6.2.7 Rev 2)**. The LBMEP (of which this appendix is part of) sets out the approach for compensating for residual habitat losses and securing a net gain for biodiversity.
Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere	Avoid impacts on irreplaceable biodiversity - these impacts cannot be offset to achieve No Net Loss or Net Gain.	The Proposed Development is located on land of inherently low biodiversity value and	**Chapter 11**: Biodiversity and Nature Conservation (Application Document Ref. 6.2.11, **APP-054**) including

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
		consequently no irreplaceable habitats would be affected.	**Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11 Rev 2**).
Principle 3. Be inclusive and equitable	Engage stakeholders early, and involve them in designing, implementing, monitoring and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible, and share the benefits fairly among stakeholders.	NLC (the authority that will be responsible for agreeing and discharging the final LBMEP), along with other relevant stakeholders, has been consulted regularly from scoping onwards. This has included provision of information and engagement in relation to site selection, impact avoidance, proposed specifications for landscape and biodiversity mitigation and enhancement, and agreement of use of metric to demonstrate and measure Net Gain.	Consultation Report (Applicant Document Ref. 5.1, **APP-030**). NLC Deadline 2 Submission (**REP2-015**).
Principle 4. Address risks	Mitigate difficulty, uncertainty and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when	The measures required to address risk are inherent to the approved Biodiversity Metric 3.0. The proposed habitat	Biodiversity Metric 3.0 (Natural England, 2021). LBMEP (of which this appendix is part of).

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
	calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.	interventions to achieve BNG are realistic and deliverable.	
Principle 5. Make a measurable Net Gain contribution	Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.	The current approved metric (Biodiversity Metric 3.0) has been utilised to measure the gain that can be achieved. In so doing, habitats are enhanced within green infrastructure corridors identified in the Local Plan, and on land connecting to Local Wildlife Sites.	This report.
Principle 6. Achieve the best outcomes for biodiversity	Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly-justified choices when: - Delivering compensation that is ecologically equivalent in	All the proposed habitat interventions are realistic and deliverable, and no novel or unproven techniques are required to achieve these habitats. Equivalent or better habitats are provided on-site to compensate all	LBMEP (of which this appendix is part of). NLC Deadline 2 Submission (**REP2-015**).

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
	type, amount and condition, and that accounts for the location and timing of biodiversity losses. - Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation. - Achieving Net Gain locally to the development while also contributing towards nature conservation priorities at local, regional and national levels. - Enhancing existing or creating new habitat. - Enhancing ecological connectivity by creating more, bigger, better and joined areas for biodiversity.	losses, and this has been agreed with NLC. The proposed habitats connect to and therefore bolster existing sites of biodiversity value (LWSs and the former Keadby Ash Tip).	

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
Principle 7. Be additional	Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e. do not deliver something that would occur anyway).	The proposed interventions are specific to, and will only be delivered because of, the Proposed Development.	**Chapter 11**: Biodiversity and Nature Conservation (Application Document Ref. 6.2.11, **APP-054**) including **Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11 Rev 2**). LBMEP (of which this appendix is part of).
Principle 8. Create a Net Gain legacy	Ensure Net Gain generates long-term benefits by: - Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity. - Planning for adaptive management and securing dedicated funding for long-term management. - Designing Net Gain for biodiversity to be resilient to	NLC (the authority that will be responsible for agreeing and discharging the final LBMEP) has been consulted on the proposed approach and has confirmed agreement. The habitats will be maintained for a minimum of 25 years as set out in the LBMEP. Habitat monitoring is committed and will provide the information	NLC Deadline 2 Submission (**REP2-015**). LBMEP (of which this appendix is part of).

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
	external factors, especially climate change. - Mitigating risks from other land uses. - Avoiding displacing harmful activities from one location to another. - Supporting local-level management of Net Gain activities.	needed to inform adaptive management. The proposed habitats are of types that would not reasonably be anticipated to be affected by climate change over the prescribed maintenance period.	
Principle 9. Optimise sustainability	Prioritise BNG and, where possible, optimise the wider environmental benefits for a sustainable society and economy.	The relevant guidance (CIEEM, CIRIA & IEMA, 2016) provides no further explanation to inform interpretation of this principle. The Proposed Development is accompanied by a statement on sustainability, as well as sufficient evidence on the approach to biodiversity avoidance, protection and enhancement.	This report. **Chapter 6**: Consideration of Alternatives (Application Document Ref. 6.2, **APP-049**) including Volume I of the ES Addendum (**Application Document Ref 6.2.1 – 6.2.7 Rev 2)**. **Chapter 11**: Biodiversity and Nature Conservation (Application Document Ref. 6.2.11, **APP-054**) including **Chapter 11**: Biodiversity and

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
			Nature Conservation of the ES Addendum (**Document Ref. 6.2.11 Rev 2**). **Chapter 17**: Climate Change and Sustainability (Application Document Ref. 6.2.17, **APP-060**).
Principle 10. Be transparent	Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.	This report has been prepared and structured with reference to good practice guidance (Natural England, 2021; CIEEM, 2021). The current good practice metric workbook (Biodiversity Metric 3.0) has been utilised and is available for examination by stakeholders. NLC (the authority that will be responsible for agreeing and discharging the final LBMEP), along with other relevant stakeholders, has been consulted throughout the application process.	This report. NLC Deadline 2 Submission (**REP2-015**).

5.0 PROPOSED DESIGN

5.1 Permanent Habitat Losses

5.1.1 Biodiversity Metric 3.0 only requires assessment of permanent habitat impacts. These are taken to encompass all permanent or temporary land-take where habitats will be lost and where the original baseline habitat cannot be recreated to the same or better condition within two years from the date of the impact occurring.

5.1.2 The permanent habitat losses have been digitised into the GIS, with reference to the land needed for the Proposed Development, to permit the permanent habitat losses to be quantified. The resultant habitat areas and lengths have been entered into the metric accompanying this report.

5.1.3 The relevant worst case habitat losses and the locations of these are summarised below in **Table 3**.

Table 3: Permanent habitat losses to the Proposed Development (as recorded in the metric)

Affected habitat	Construction activity	Habitat Loss
Arable	Construction laydown areas 2a and 2b	10.43ha
Modified grassland	Site clearance for construction of Proposed PCC Site	10.22ha
	A18 Junction Improvement and Mabey Bridge replacement	0.22ha
	Construction laydown area 2c	2.60ha
	Additional AIL Route	0.08ha
Other neutral grassland	Additional AIL Route	0.17ha
Unvegetated disturbed ground (unsealed land currently within Keadby 2 construction site)	Site clearance for construction of Proposed PCC Site	4.58ha
Other woodland; broad-leaved	Additional AIL Route	0.03ha

Affected habitat	Construction activity	Habitat Loss
Mixed scrub	Site clearance for construction of Proposed PCC Site	0.09ha
Hawthorn scrub	Site clearance for construction of Proposed PCC Site	0.23ha
Bramble scrub	Additional AIL Route	0.04ha
OMH	Site clearance for construction of Proposed PCC Site	0.25ha
Ditch	Infilling of minor drain (Drain 4) bisecting Keadby Common during site clearance for Proposed PCC Site.	0.38km
	Construction of bridge for Emergency Vehicle Access Road over Glew Drain.	0.015km
Stainforth and Keadby Canal (in-channel habitat only)	Intrusion into channel from proposed Canal Water Abstraction Option.	0.013km
Hatfield Waste Drain (riparian habitat only)	A18 Junction Improvement and Mabey Bridge replacement (note the impact on terrestrial habitat is also factored, see above).	0.136km

5.2 Temporary Habitat Losses

5.2.1 Where a habitat is impacted for a short period of time before being restored back to the same habitat in its original condition or better this can be considered a temporary loss. In such circumstances, it is not necessary to record the loss within Biodiversity Metric 3.0 and instead the habitat is recorded as ‘retained’.

5.2.2 Biodiversity Metric 3.0 only considers losses to be temporary when the original baseline habitat will be recreated in the same or better condition within 2 years from the date of the impact occurring. This requires the habitat creation/restoration to be complete, not just that seed has been sown or whips planted. This means that the temporary loss option generally only applies to habitats of relatively simple structure and composition and of relatively poor condition. For example, it could encompass impacts affecting species-poor

modified grasslands such as sports pitches and agriculturally improved pasture, but not permanent species-rich grasslands or scrub habitat.

5.2.3 In relation to the Proposed Development, the following temporary habitat losses are identified and are excluded from the BNG calculation:

- Installation of an eel screen for the proposed River Water Abstraction Option (if chosen) given this would only affect estuarine sediments deposited over the existing concrete apron of the intake structure, and within an area already subject to periodic dredging to maintain the intake.
- Disturbance of and/or laydown on the mown modified grassland on the flood embankment adjacent to the existing river water intake during installation of an eel screen (see above).
- Disturbance of and/or laydown on the modified grassland when the adjacent existing Mabey Bridge is replaced for the Proposed Development.
- Small-scale cut and cover crossings of ditches that might be required during installation of the Potential Electrical Connection to Northern Powergrid 132kV Substation, where the existing substrates would be reinstated, and the affected modified grassland flora is typified by a limited suite of grasses and ruderal herbs that is capable of re-establishing in one to two growing seasons.
- Replacement of the gatehouse at the site entrance of the A18 within the existing footprint of the existing gatehouse and its associated hardstanding.

5.2.4 Consistent with the above, use of existing hardstanding of no inherent biodiversity value for laydown is also considered a temporary loss even if required for a period longer than 2 years. This is consistent with the 'common sense' principle within the guidance (Natural England, 2021), given use of such land is not likely to meaningfully impact upon biodiversity and because it reduces the need for losses of semi-natural habitats elsewhere. This rationale also covers construction (if chosen) of the proposed Canal Water Abstraction Option, which will be located within the footprint of an area of hardstanding installed during construction of the consented Keadby 2 Power Station canal water abstraction structure.

5.2.5 For purposes of clarity, as explained elsewhere within the application, it is re-stated that much of the land within the Order Limits will not be affected by the Proposed Development. For example, the Order Limits encompass locations where existing buried infrastructure would be utilized by the Proposed Development, the existing AIL route and associated bridge structures constructed for Keadby 2 Power Station that will be utilised during construction of the Proposed Development (on land within the Additional AIL Route), and other existing infrastructure to be utilised in manner consistent with its intended purposes e.g. use of existing roads and the port facilities at Keadby.

5.3 Development of the Proposed Design

5.3.1 The proposed design has been developed to respond specifically to relevant local and national biodiversity strategies, as summarised below in Table 4. Further information is provided in the LBMEP (of which this appendix is part of). The proposed habitat interventions to achieve No Net Loss and BNG can be summarised as:

- Creation of other neutral grassland to compensate for losses of modified grassland (including conversion of an existing hardstanding car park to grassland);
- Enhancement of existing other neutral grassland to compensate for the minor loss of this grassland type;
- New native woodland and tree plantings to compensate for losses of plantation woodland;
- New mixed scrub plantings to compensate for losses of all scrub types;
- New hedgerow plantings to extend existing retained hedgerows;
- Provision of a Sustainable Urban Drainage feature;
- Enhancement of ditches on the boundary of the PCC Site to compensate for the loss of Drain 4;
- Enhancement of the riparian vegetation structure adjacent to the Hatfield Waste Drain through the above scrub planting; and
- Enhancement of the Stainforth and Keadby Canal through creation of marginal emergent vegetation to enhance the north bank.

5.3.2 The above habitat gains can largely be achieved through interventions within the Order Limits and within land controlled by the Applicant. The exception is the proposed intervention within the Stainforth and Keadby Canal which requires the agreement of the Canal and River Trust.

5.3.3 As set out in the LBMEP, the following additional species-specific measures are proposed in addition to the habitat interventions measured by the BNG assessment:

- 3 No. pole mounted barn owl towers;
- 5 No. Schwegler 1FD or comparable bat boxes suitable for maternity roosting;
- 5 No. Schwegler 2F universal bat boxes, or comparable boxes;
- 5 No. tawny owl nesting boxes (suitable also for other bird species requiring larger nesting cavities); and
- ring-barking of suitable trees to enhance the resource of standing deadwood available to willow tit.

5.3.4 The above species-specific measures will be provided in the former Keadby Ash Tip which is located outside the Order Limits but otherwise within the control of the Applicant. The target species listed above are those that require mature trees or standing deadwood for roosting or nesting, conditions that are currently absent or in short supply due to the relatively young age of the woodland and scrub present within and adjacent to the Proposed Development Site.

Table 4: Response to relevant biodiversity strategies

Plan	Response
Lincolnshire LBAP, 3rd Edition	The Proposed Development has sought to avoid impacting the OMH of the former Keadby Ash Tip. Where an impact on a small area of ancillary connected habitat could not be avoided the proposed habitat mitigation has been discussed and agreed with NLC. Suitable comparable habitat (flower-rich grassland) will be created on land adjacent to the former Keadby Ash Tip, extending such habitat beyond the boundaries of the former Keadby Ash Tip. The wider approach to creating and enhancing grassland is consistent with the objective to "*create 40ha of lowland meadow with priority given to buffering,* *linking or expanding sites meeting LWS criteria*."
North Lincolnshire LDF Core Strategy June 2011	The BNG approach is consistent with the aim to "*protect, enhance and restore biological diversity*." The proposed habitats include interventions that will improve the biodiversity value of identified green infrastructure e.g. through management to enhance ditches, and the creation of flower-rich grassland next to watercourses.
North Lincolnshire Local Plan Publication Plan October 2021	The BNG approach include provisions for the long-term management and maintenance of existing and new landscaping. It also enhances important natural landscape features, including rivers and identified green infrastructure, with reference to the published Biodiversity Opportunity Mapping. The proposals complement existing habitats of high biodiversity importance including the adjacent former Keadby Ash Tip and nearby LWSs.

Plan	Response
National Pollinator Strategy	The BNG approach engages with the objectives of the strategy by providing "*new flower-rich habitats*" that are "*joined-up to existing sites*" of known importance for invertebrates e.g. the former Keadby Ash Tip.
NCA Profile: 39 Humberhead Levels	The proposed enhancement of ditch habitats reflects the objective to bring ditches "*under sound rotational management so that they continue to function while also retaining a proportion of emergent vegetation, thus forming key links between wetland and other semi-natural habitats, and providing important habitats for species such as water voles and dragonflies*." It also contributes to "*the introduction of a wider range of habitats within arable areas, such as permanent grassland field margins and buffers alongside watercourses and wetland habitats, and linking them where possible to other semi-natural habitats to create more resilient networks and enable species movement …*"

6.0 BNG METRIC

6.1 Overview

6.1.1 The Biodiversity Metric 3.0 workbook used to make the BNG assessment is captured within this document (as **Annex B**) and will be provided to relevant stakeholders on request. The habitat parcels referenced in the workbook relate directly to the Habitat Baseline Plan (**Figure 1**), the River Baseline Plan (**Figure 2**) and the Post-Development Plan which is provided as **Figure 1** of the LBMEP. The habitat conditions applied to the relevant habitats are explained in **Annex A** to support the supplementary notes entered into the workbook.

6.2 Ability to Deliver No Net Loss

6.2.1 The assessment concludes that planning policy requirement for No Net Loss can be achieved, either through direct compensation for the habitats lost or through replacement with habitats of higher distinctiveness and/or condition. Only one habitat trading exception, relating to OMH, is recorded in the workbook (**Annex B**). However, acknowledging the metric is a 'blunt instrument' (see Section 2.6), this is not considered to be a material exception, as explained further below.

6.2.2 It is not possible to compensate like for like for the minor loss of OMH to the Proposed development. However, functionally comparable habitat is delivered with the shortfall in OMH addressed through the proposed native flower-rich other neutral grassland creation and enhancement. The habitat can be expected to benefit pollinators and other terrestrial invertebrates i.e. species groups for which OMH is important.

6.2.3 In specific relation to the OMH, the current approach for assessing the balance between habitat losses and gains requires like for like replacement of OMH regardless of the specific quality and scale of loss i.e. there is no flexibility within the metric to consider context (although offline agreement of bespoke mitigation is otherwise permissible). Creation of new OMH is not possible as suitable ground conditions are not available and, even then, there would be low confidence in the ability to reinstate comparable OMH. The affected OMH is otherwise, as explained in **Chapter 11** (ES Volume I, **Application Document Ref. 6.2**) including **Chapter 11**: Biodiversity and Nature Conservation of the ES Addendum (**Document Ref. 6.2.11 Rev 2**), not typical of the wider retained OMH resource within the former Keadby Ash Tip.

6.2.4 Of relevance to options for bespoke mitigation, Natural England has stated '*artificially created and planted areas that mimic semi-natural habitats such as species-rich grassland would also be in scope* [of this habitat type]' (Natural England, 2019). Accordingly, it is considered that creation of flower-rich grassland is a valid approach to address the small loss of OMH to the Proposed Development. This approach has been agreed with NLC. The proposed new grassland habitat will add to the diversity and complexity of existing flower-rich

habitats associated with the former Keadby Ash Tip and the connected Stainforth and Keadby Canal Corridor LWS (extending this into adjacent land), and therefore directly complements and diversifies habitat quality for the notable terrestrial invertebrate assemblage that is focussed on the former Keadby Ash Tip (as described in **Appendix 11C** – ES Volume II (**Application Document Ref. 6.3**) including **Appendix 11C:** Preliminary Ecological Appraisal Report of the ES Addendum (**Application Document Ref 6.2.11 Rev 2**).

6.3 Ability to Deliver Biodiversity Net Gain

6.3.1 The assessment concludes that the planning policy requirement for BNG can be met, with the gains estimated as follows:

- 10.62% increase in habitat units
- 27.58% increase in hedgerow units
- 1.80% increase in river units

6.3.2 While there is currently no planning policy or legal requirement to deliver a specific quantum of BNG (with demonstration of a quantifiable gain being sufficient), the assessment indicates that the increase in habitat and hedgerow units is consistent with the 10% minimum BNG threshold to be mandated by the Environment Act 2021 for NSIP developments from 2025.

6.3.3 10% BNG cannot be achieved within the Order Limits in relation to river units, due to the baseline context of the relevant rivers (the heavily engineered Stainforth and Keadby Canal and the Hatfield Waste Drain), the tightly defined red line within which suitable BNG interventions have already been proposed, the presence of existing banktop vegetation of optimal structure (meaning further plantings are not feasible), and/ or other constraints that prevent creation of bank top habitats (existing hard landscaping, towpaths, other access and maintenance considerations). Given these considerations, it is not considered realistic to offer further habitat interventions of sufficient magnitude to realistically boost condition any higher than ‘Fairly Good’. Therefore, it is considered that weight should be given to the clearly very minor habitat impacts from the Proposed Development (which do not meet the formal definition for meaningful encroachment, even though Metric 3.0 otherwise records a loss in habitat units), the fact that realistic interventions are proposed to achieve a measurable BNG, and the wider gains in terms of habitat and hedgerow units.

7.0 PROJECT IMPLEMENTATION AND CONSTRUCTION PLAN

7.1.1 The good practice requirement to provide a project implementation and construction plan is met by the following documents submitted with the application:

- Indicative Landscape and Biodiversity Plan (Application Document Ref. 4.15, **APP-024**); and
- Landscaping and Biodiversity Management and Enhancement Plan (of which this appendix is part of).

7.1.2 It is intended that these plans will be updated prior to construction as a Requirement of the DCO.

8.0 BNG MANAGEMENT AND MONITORING PLAN

8.1.1 The good practice requirement to provide a project implementation and construction plan is met by the following documents submitted with the application:

- Landscaping and Biodiversity Management and Enhancement Plan (of which this appendix is part of).

8.1.2 It is intended that this document will be updated prior to construction as a Requirement of the DCO.

9.0 REFERENCES

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FIGURES

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Drawn: CA Checked: JW Approved: DB Date: 31/03/2022

Revision: 01

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

- Site Boundary
- Cereal crops
- Other neutral grassland
- Modified grassland
- Bramble scrub
- Hawthorn scrub
- Mixed scrub
- Open mosaic habitats
- Other woodland; broadleaved
- Wet Woodland
- Sparsely vegetated ground – ruderal/ephemeral
- Urban - introduced shrub
- Urban - Developed land; sealed surface
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- Urban - artificial unvegetated, unsealed surface
- Ditch - no longer exists
- Culverted
- Watercourse
- Native Hedgerow - Associated with bank or ditch
- Native hedgerow
- Native species-rich hedgerow with trees
- Urban - street tree

NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 1

SHEET NUMBER

Figure 1

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Revision: 01

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

- Site Boundary
- Cereal crops
- Other neutral grassland
- Modified grassland
- Bramble scrub
- Hawthorn scrub
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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 2

SHEET NUMBER

Figure 1

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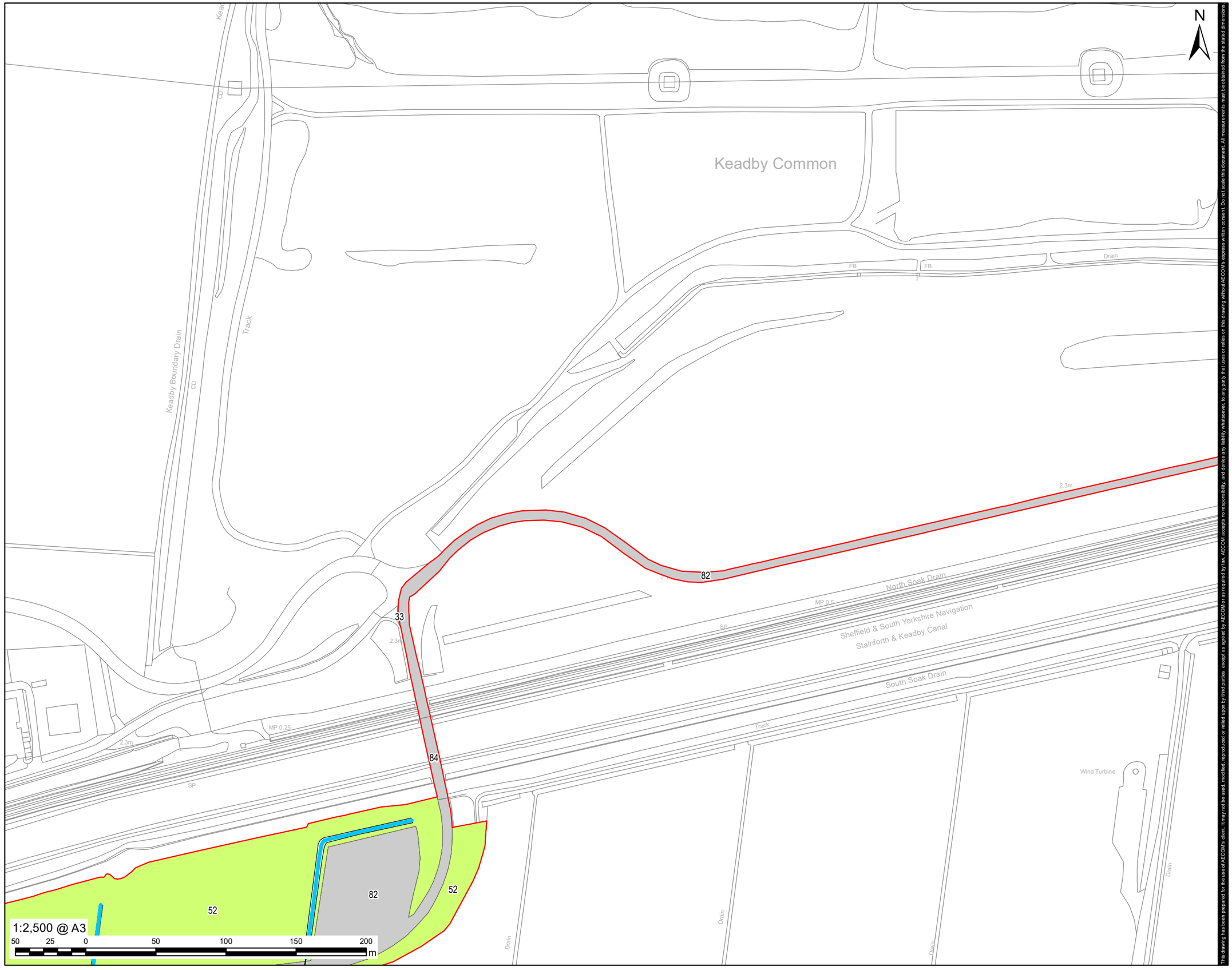

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 3

SHEET NUMBER

Figure 1

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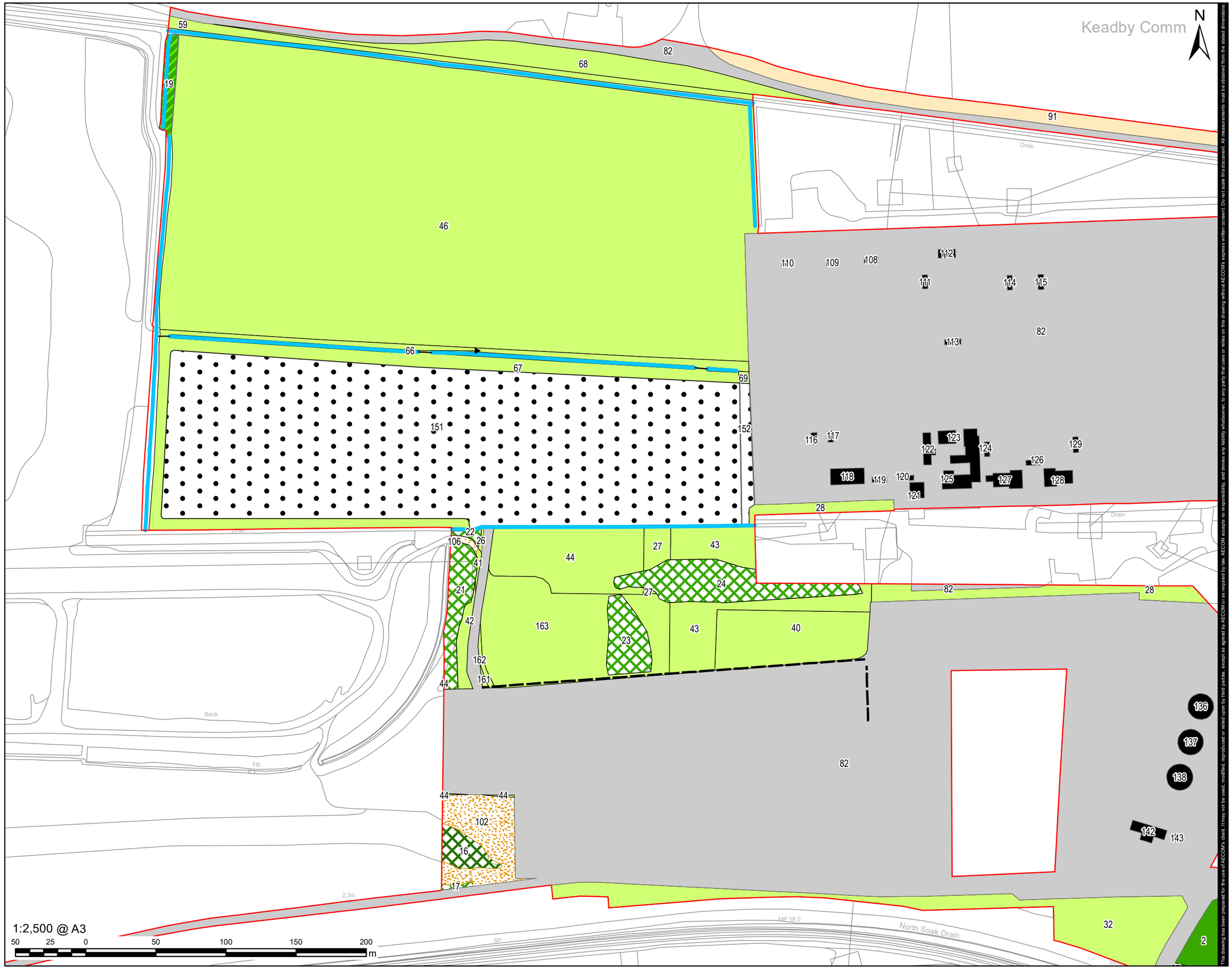

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
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Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 4

SHEET NUMBER

Figure 1

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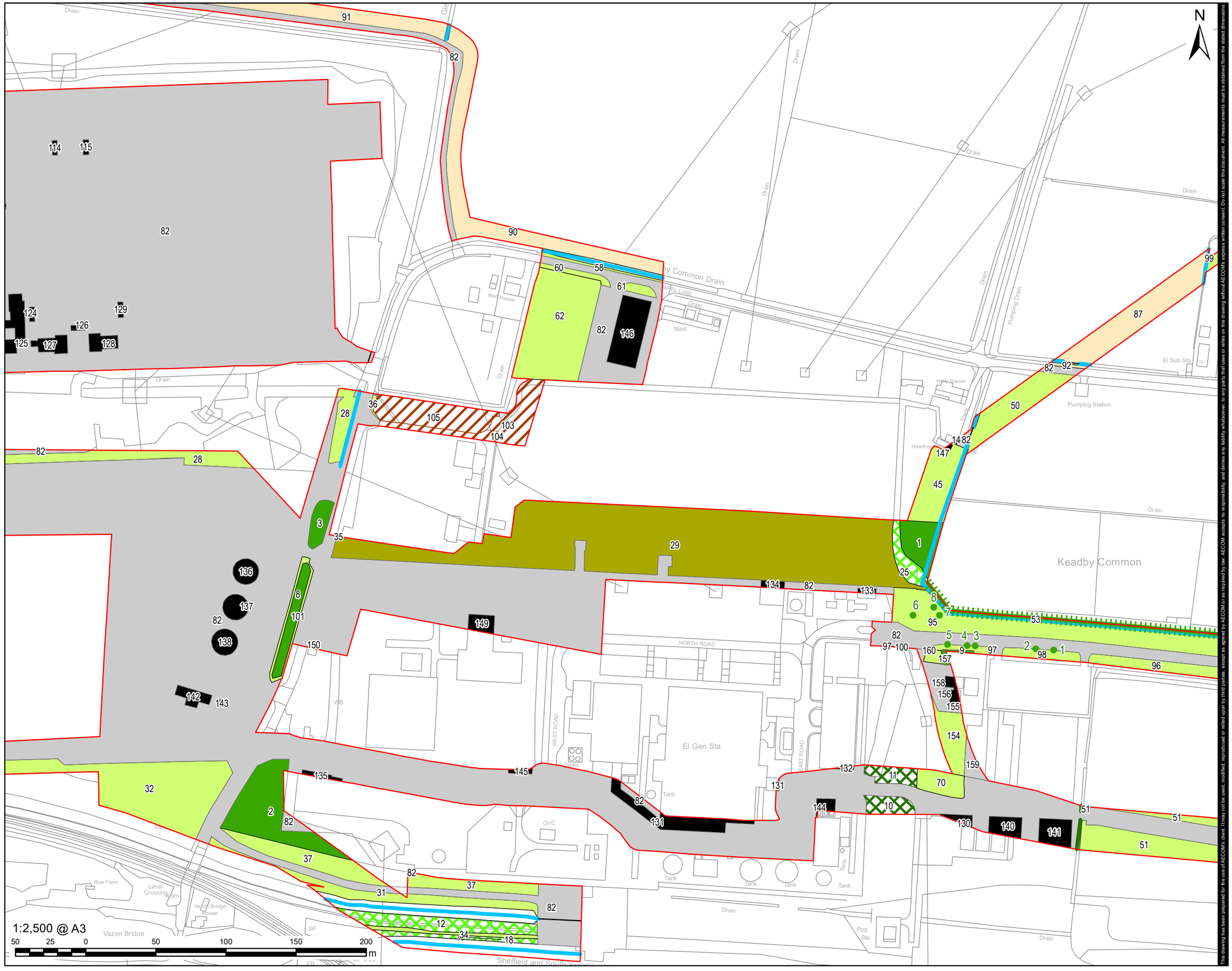

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 5

SHEET NUMBER

Figure 1

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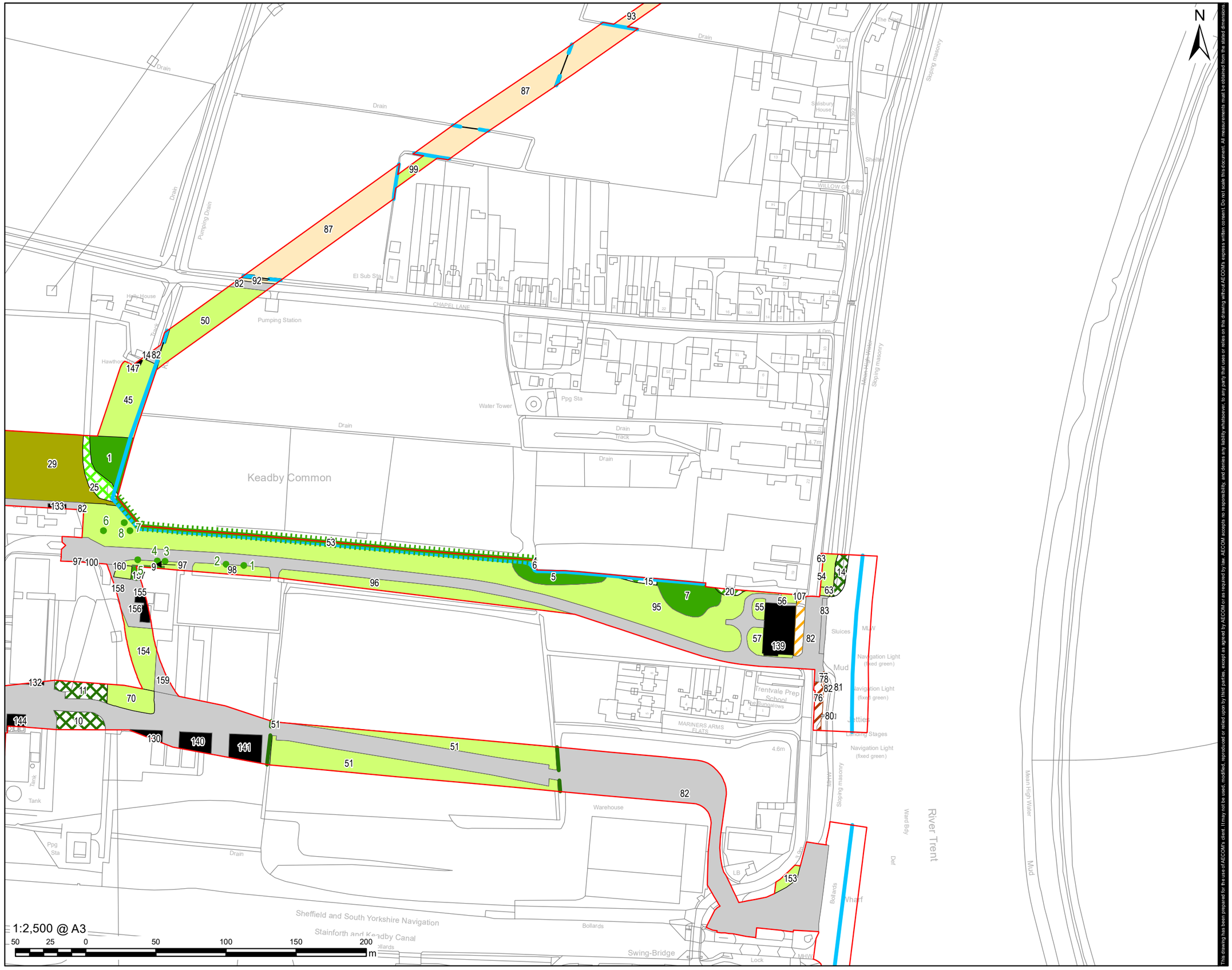

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 6

SHEET NUMBER

Figure 1

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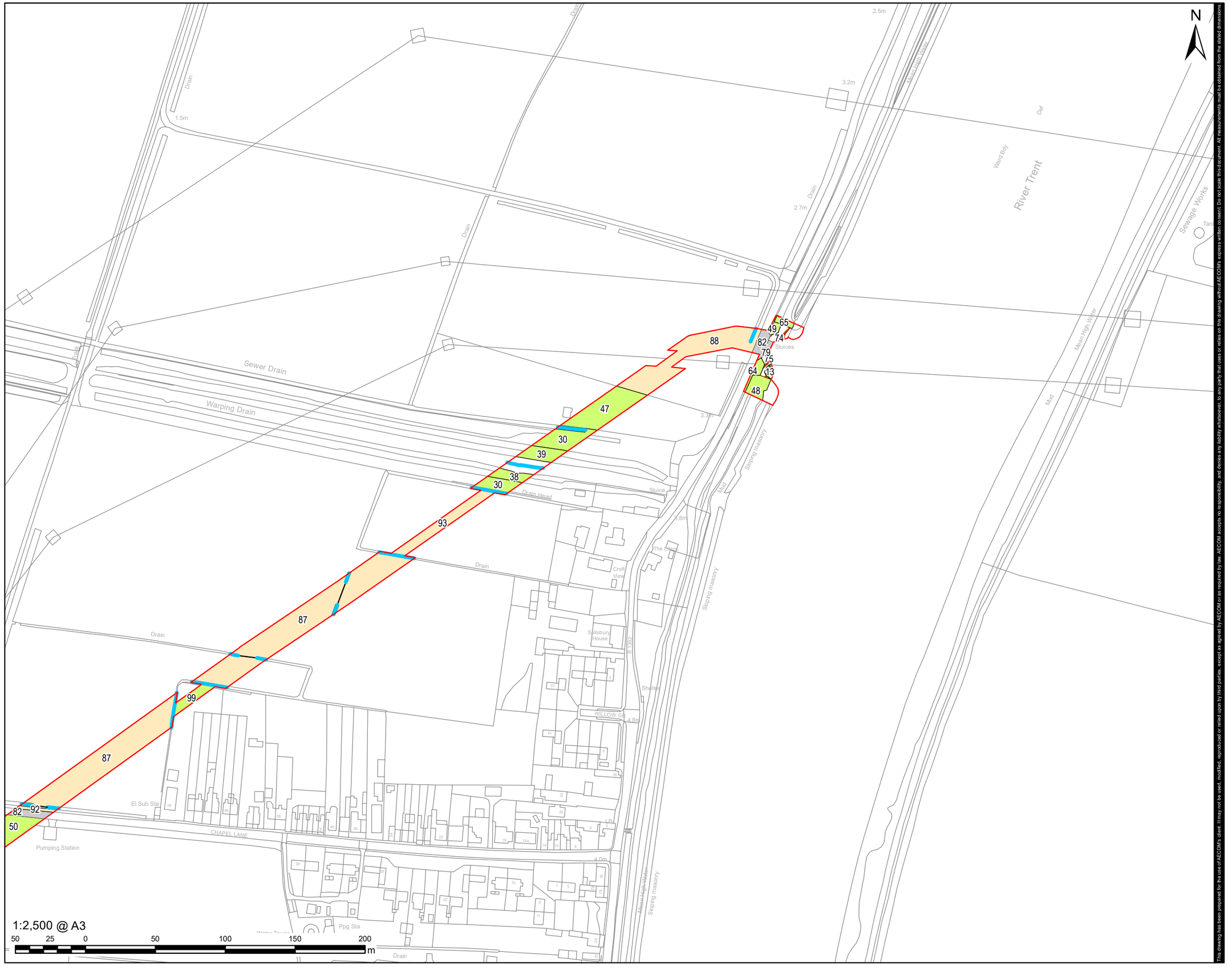

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 7

SHEET NUMBER

Figure 1

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PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 1

SHEET NUMBER

Figure 2

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AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 2

SHEET NUMBER

Figure 2

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Revision: 01

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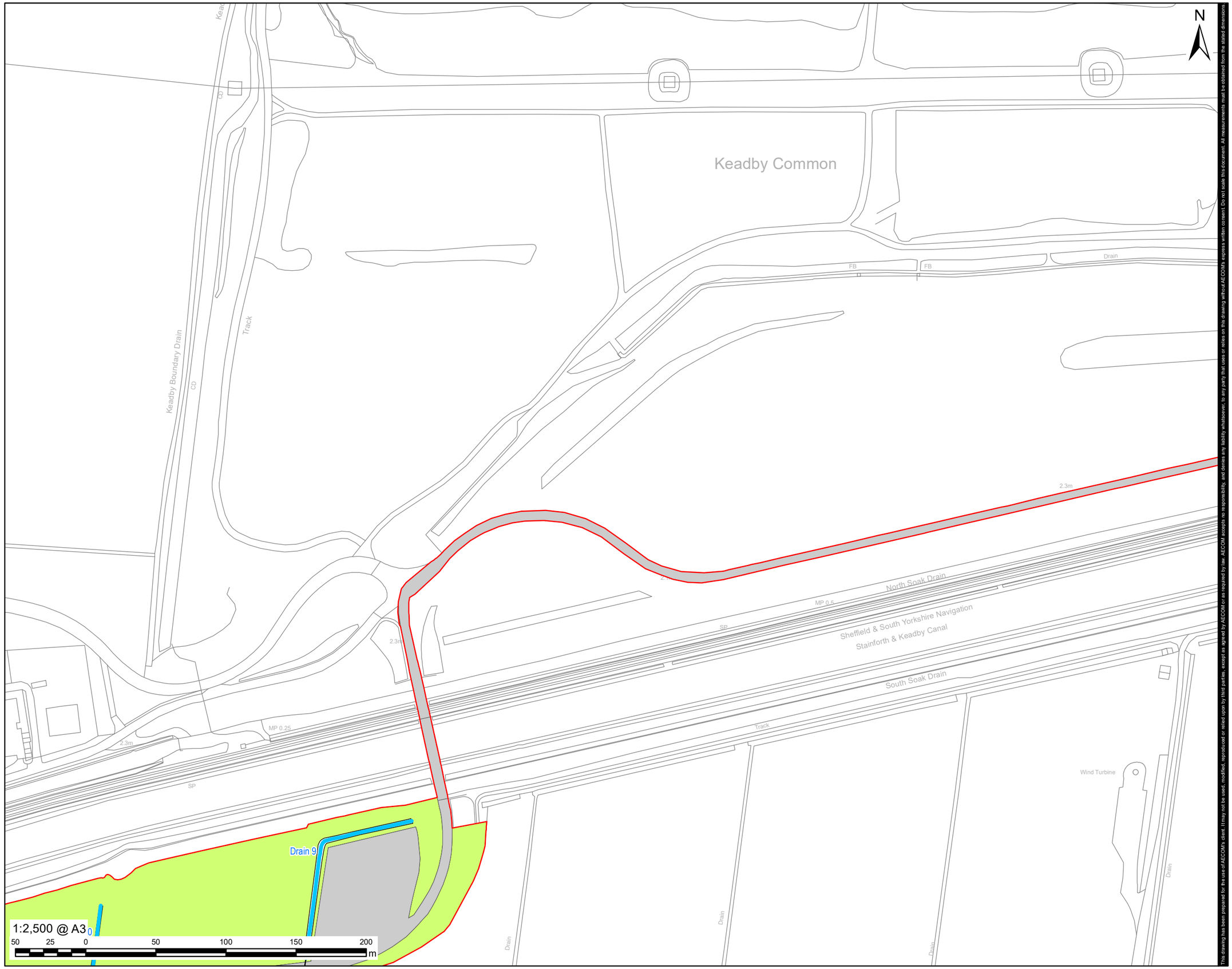

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 3

SHEET NUMBER

Figure 2

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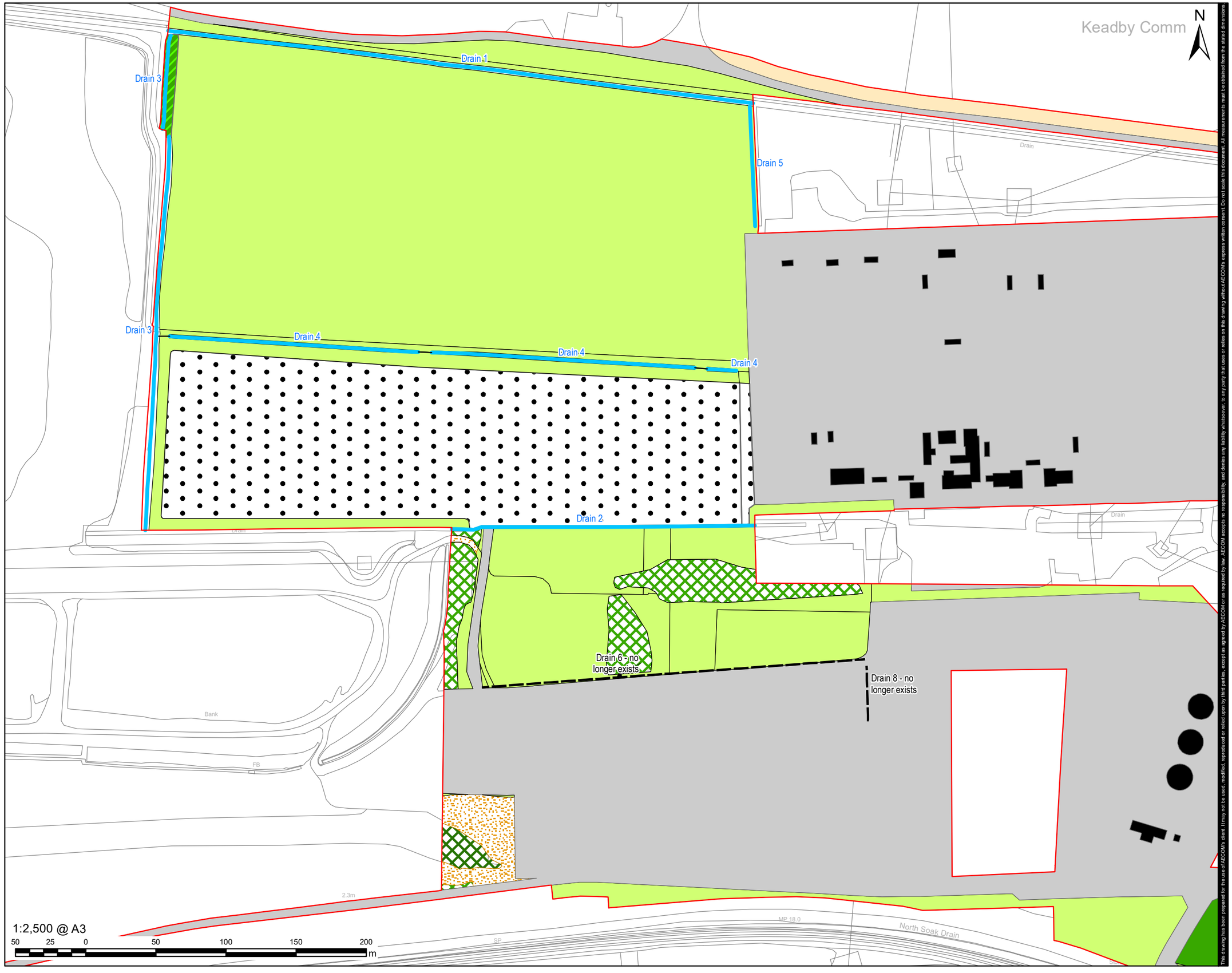

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 4

SHEET NUMBER

Figure 2

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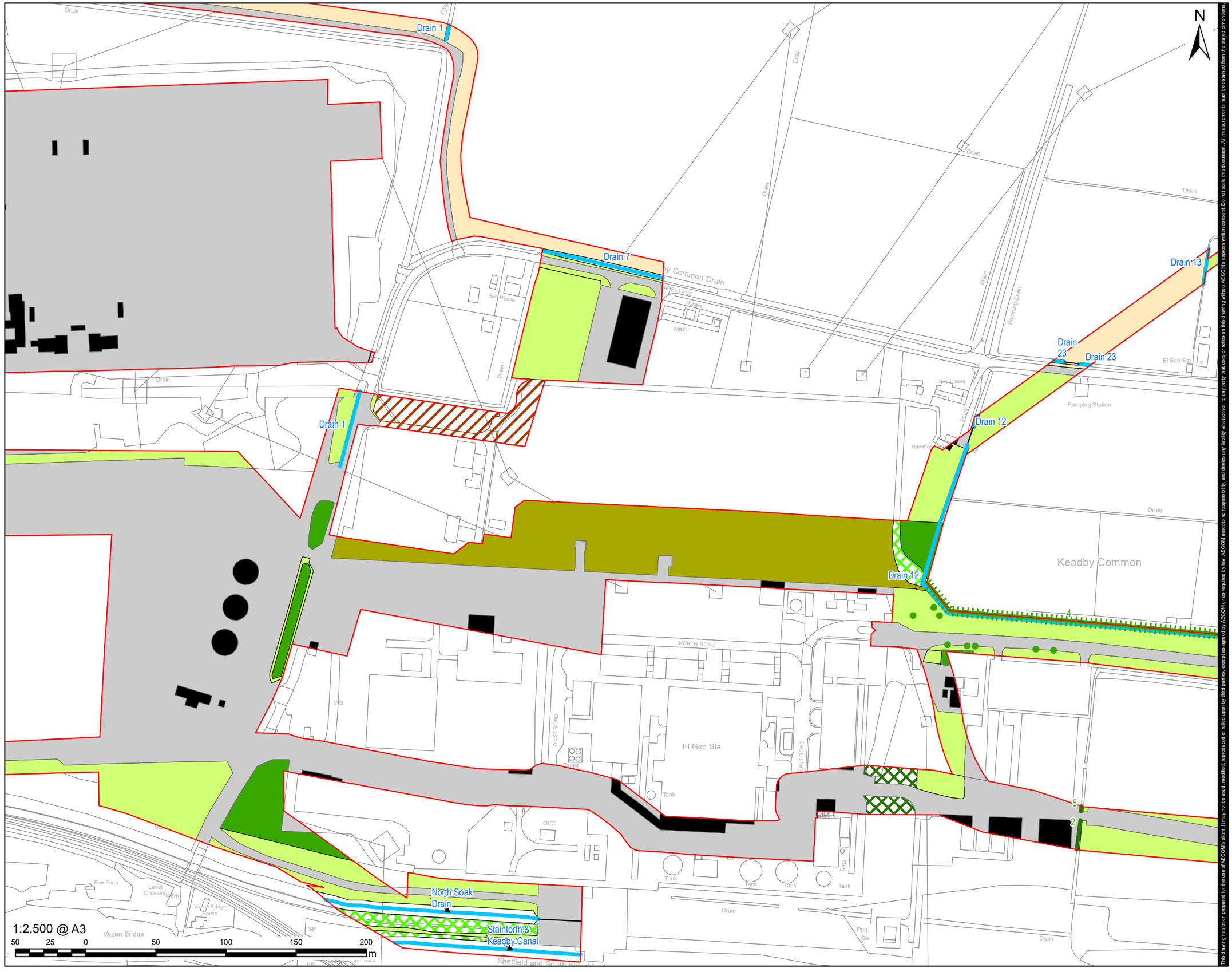

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 5

SHEET NUMBER

Figure 2

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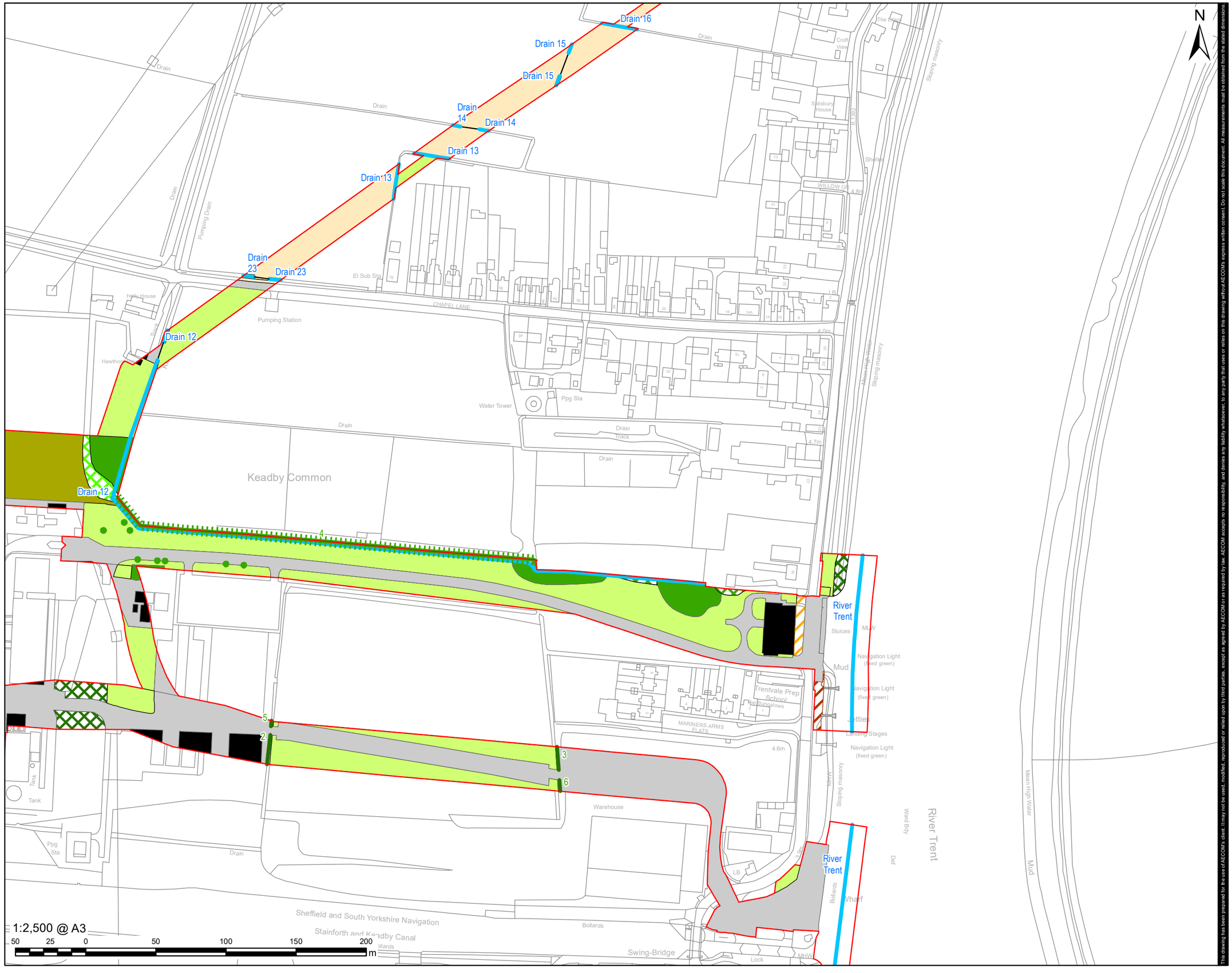

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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NOTES

ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 6

SHEET NUMBER

Figure 2

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Revision: 01

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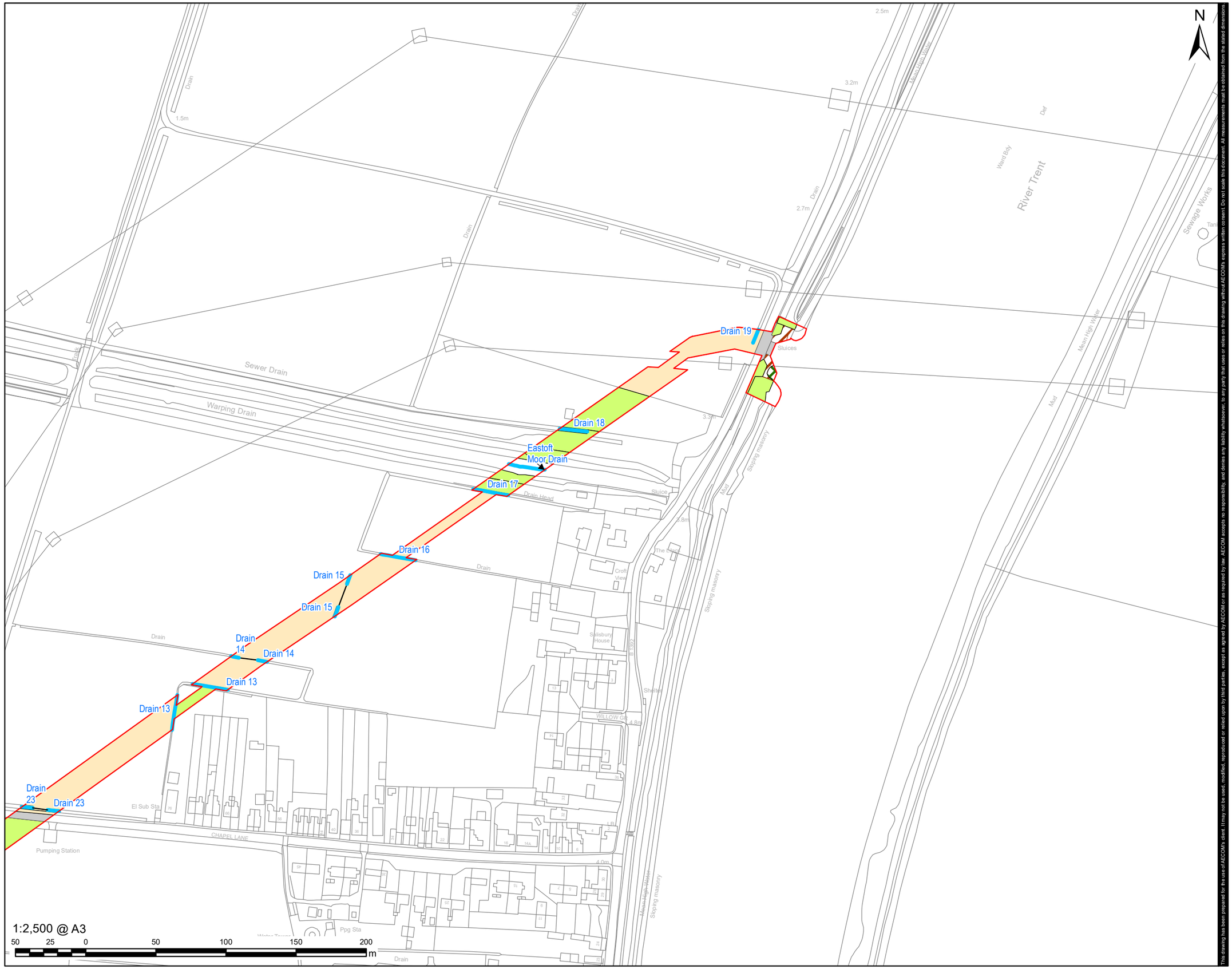

AECOM

PROJECT

The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT

Keadby Generation Limited

CONSULTANT

AECOM Limited
2 City Walk
Leeds
LS11 9AR
[redacted]

LEGEND

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ISSUE PURPOSE

BNG ASSESSMENT

PROJECT NUMBER

60625943

SHEET TITLE

Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 7

SHEET NUMBER

Figure 2

ANNEX A: SUMMARY OF BASELINE AND POST DEVELOPMENT HABITAT CONDITION

Table A.1: Baseline Condition of Semi-Natural Habitats

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
Arable – cereal crops	All parcels	N/A	Default score
Artificial unvegetated	All parcels	N/A	Default score
Bramble scrub	All parcels	Poor	Default score
Canal	Stainforth and Keadby Canal	Poor	Output from MoRPh assessment
Ditches	6-11 and 21	Poor	- No signs of pollution (pass) - Aquatic flora rare and of low diversity (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Insufficient water levels and prone to drying (fail) - Shading <50% of length (pass) - No INNS (pass)
Ditches	1	Moderate	- No signs of pollution (pass) - A range of aquatic plants present (pass) - Duckweed and algae <10% cover (pass)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			- Marginal vegetation along >75% of length (pass) - No damage (pass) - Sufficient water levels (pass) - No shading (pass) - Elodea nuttallii abundant (fail)
Ditches	2	Poor	- No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail) - No INNS (pass)
Ditches	3	Poor	- No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			- No INNS (pass)
Ditches	4	Poor	- No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail) - No INNS (pass)
Ditches	5	Poor	- No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail) - No INNS (pass)
Ditches	All other ditches	Moderate	- Reasonable assumption where ditches were not visited because they are located beyond the land required for construction.

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
Hawthorn scrub	All parcels	Poor	- >75% hawthorn (fail) - Uniform age structure (fail) - No INNS or undesirables (pass) - Poorly developed edge (fail) - No glades (fail)
Introduced shrub	All parcels	Poor	Default score
Mixed scrub	All parcels	Poor	- Some stands are not dominated by a single species, other stands >75% one species (pass, based on stands in best condition) - Uniform age structure (fail) - No INNS or undesirables (pass) - Poorly developed edge (fail) - No glades (fail)
Modified grassland	All parcels except the following	Poor	- Mean of <6 species per m^2 (fail) - Sward heigh uniform (fail) - Minimal scrub encroachment (pass) - No damage (pass) - No bare ground (fail) - No bracken (pass) - No Invasive Non-native Species (INNS)/ undesirables frequent (either white clover in sown grassland, or weeds in unmanaged grassland (fail)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			Reasonable assumption where parcels beyond the land required for construction was not visited.
Modified grassland	26, 27, 41, 42, 43 & 44	Moderate	- Mean of >6 species per m^2 (pass) - Sward heigh uniform (fail) - Scrub encroachment <20% (pass) - No damage (pass) - No bare ground (fail) - No bracken (pass) - No Invasive Non-native Species (INNS)/ undesirables at low cover (pass)
Native hedgerow associated with bank or ditch	All parcels	Good	Unaffected mature hedgerows adjacent to existing AIL route constructed for Keadby 2 Power Station. Not relevant to Proposed Development so not surveyed. Assume Good condition.
Native hedgerow with trees	All parcels	Moderate	Unaffected existing hedgerow. Fails on height (criteria A1 - <1.5m tall) and width (A2 - <1.5m width).
Native species rich hedgerow	All parcels	Poor	Unaffected young planting still in tree tubes next to permanent access route off A18. Mixed native species. Fails criteria A1 (<1.5m tall), A2 (<1.5m wide), B1 (as still in tubes), B2 (still very gappy, shrubs yet to merge), C1 (road verge regularly mown).
OMH	All parcels	Fairly Poor	- Uniform structure (fail) - Moderate herb diversity but limited flower resource (midpoint between pass/fail)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			- INNS rare (pass) - Spatial variation not consistent with formal definition of OMH (fail) Existing disturbed ground coinciding with access route for vehicles into ash tip. Nominally (given connected), but trivial, part of OMH in main ash tip. Some botanical interest but value limited by use for access. Contributes negligibly to the invertebrate interest of the main ash tip, substrates compacted. Scored as Fairly Poor based on above and professional judgement.
Other neutral grassland	All parcels	Poor	- Appearance typical (pass) - Sward height uniform (fail) - No bare ground (fail) - No bracken but scrub >5% cover (fail) - No INNS and undesirables at low cover (pass)
Other rivers and streams	Hatfield Waste Drain	Moderate	Output from MoRPh assessment
Other woodland, broadleaved	All parcels	Moderate	- 1 age class (1 point) - No browsing damage (3 points) - No INNS (3 points) - >4 native species (3 points) - Native woodland (3 points)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			- No open space (1 point) - Some regeneration (2 points) - No disease seen (3 points) - Secondary woodland so not good example of NVC type (1 point) - One storey (1 point) - No veterans (1 point) - Minimal deadwood (1 point) - No enrichment (3 points)
Ruderal/ ephemeral	All parcels	Poor	- Not a good match for a named vegetation type (fail) - No significant tree cover (pass) - Largely comprised of weed species (fail) - Vegetation at least 5% (pass)
Wet woodland	All parcels	Moderate	- 2 age classes (2 points) - No browsing damage (3 points) - No INNS (3 points) - 3-4 native species (2 points) - Native woodland (3 points) - No open space (1 point) - Some regeneration (2 points) - No disease seen (3 points)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			- Secondary woodland so not good example of NVC type (1 point) - One storey (1 point) - No veterans (1 point) - Minimal deadwood (1 point) - No enrichment (3 points)

Table A.2: Post Development Condition of New/Enhanced Habitats

Habitat	ID	Proposed condition	Reason for the assigned condition
Canal	Stainforth and Keadby Canal	Fairly Good	Proposed marginal vegetation increases vegetation structure and naturalness of the canal from a very low baseline. For purposes of MoRPh assessment this is sufficient to raise the condition from Poor.
Ditches	Ditches 2, 3, 5	Moderate	- Proposed Development will not pollute the ditch (pass) - Dredging to be undertaken to reduce dominance of reeds and to create open water likely to promote aquatic flora. Additional benefit from reduction in shading (pass) - Baseline algae/ duckweed >10% cover and no certainty of improvement (fail) - Proposed reduction in shading likely to promote marginal vegetation and permit occupancy along >75% of length (pass)

Habitat	ID	Proposed condition	Reason for the assigned condition
			- Proposed Development will not damage the ditch (pass) - Sufficient water levels, with improvement as a result of the proposed dredging (pass) - Management proposed to reduce shading to <50% of length (pass) - No INNS likely to colonise as a consequence of Proposed Development (pass)
Mixed scrub	C8, C9	Moderate	- Species-rich plantings proposed so that no one species dominates (pass) - Planting stock will have a uniform age structure (fail) - No INNS or undesirables likely with proposed management (pass) - Adjacent habitats also to be enhanced, so able to create ecotones; also adjacent to watercourse, another ecotone (pass) - No glades feasible in scrub stand of the proposed size (fail)
Native species rich hedgerow	As shown on post developme nt plan	Poor	Condition likely to be Moderate within 5 years but this is not overstated for purposes of the assessment as requirements to maintain an oversail for large deliveries to the existing wind farm may limit the height of the new hedgerow. Therefore the minimum commitment is to achieve a hedgerow comparable to that already present.
Other neutral grassland	C4, C6, C7	Moderate	Habitat creation and aftercare to achieve:

Habitat	ID	Proposed condition	Reason for the assigned condition
			- Proposed seed mixture will result in grassland of native composition and good botanical diversity (pass) - Mowing regimes proposed to achieve sward structural diversity (pass) - Ability to achieve and maintain small scale bare ground uncertain (fail) - Scrub/ bracken to be maintained at optimal level (pass) - INNS and undesirables to be controlled (pass)
Other neutral grassland	C6	Moderate	Habitat management to enhance condition (small area to be resown as per the row above). - Existing species diversity is typical but can be boosted further with management and supplementary seeding (pass) - Mowing regimes to achieve sward structural diversity (pass) - Ability to achieve and maintain small scale bare ground uncertain (fail) - Scrub/ bracken to be removed and maintained at optimal level (pass) - INNS and undesirables to be controlled (pass)
Other rivers and streams	Hatfield Waste Drain	Fairly Good	Proposed scrub planting beneficially increases vegetation structure in riparian zone. For purposes of MoRPh assessment this is sufficient to raise the condition from Moderate.
Other woodland, broadleaved	C5, C10	Moderate	Aim is to establish woodland at least comparable to the original plantation. Generic semi-mature plantation woodland typically

Habitat	ID	Proposed condition	Reason for the assigned condition
			achieves Moderate (Poor and Good woodlands are rare and are respectively either very young or mature woodlands).
Sustainable Urban Drainage feature	C3	Fairly Poor	No clear guidance on assessment parameters. However, any standing water can expect to be colonised by aquatic flora and fauna. Based on the pond criteria: - Fed by surface water run-off so water quality likely to be reasonable (pass) - To be surrounded by semi-natural grassland (pass) - Not possible to assume absence of algae/duckweed (fail) - Standalone water body (pass) - Design can allow for fluctuating water levels (pass) - Aim would be to prevent introduction of INNS (pass) - No fish stocking proposed (pass) - Preference is a concrete liner so only structurally simple vegetation likely to establish (fail) - Unshaded by trees/scrub (pass) Moderate condition feasible but assume fairly poor given pond yet to be designed.

ANNEX B: SUMMARY OF DATA ENTERED INTO AND RESULTS OF THE METRIC 3.0 WORKBOOK

A summary of the assessment is provided below. The Metric 3.0 Excel workbook will be provided to relevant stakeholders on request.

Keadby 3 Carbon Capture Power Station
Headline Results

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On-site baseline	*Habitat units*	92.57
	Hedgerow units	6.98
	River units	26.51
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	102.41
	Hedgerow units	8.90
	River units	26.99
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	10.62%
	Hedgerow units	27.58%
	River units	1.80%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	9.83
	Hedgerow units	1.92
	River units	0.48
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	10.62%
	Hedgerow units	27.58%
	River units	1.80%

Trading Summary

Distinctiveness Group	Trading Rule	Trading Satisfied?
Very High	Bespoke compensation likely to be required	Yes
High	Same habitat required	No
Medium	Same broad habitat or a higher distinctiveness habitat required	Yes
Low	Same distinctiveness or better habitat required	Yes

Keadby 3 Carbon Capture Power Station
A-1 Site Habitat Baseline

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	Habitats and areas			Distinctiveness	Condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comments	
Ref	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Condition	Strategic significance		Total habitat units	Area retained	Area enhanced	Baseline units	Baseline units enhance	Area lost	Units lost		Assessor comments	Reviewer comments
1	Grassland	Modified grassland	8.21	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	16.42			0.00	0.00	8.21	16.42		PCC Site - Keadby Common. Parcel 46	
2	Grassland	Modified grassland	0.62	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.24			0.00	0.00	0.62	1.24		PCC Site - Keadby Common. Parcel 67	
3	Urban	Artificial unvegetated, unsealed surface	4.58	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Compensation Not Required	0.00			0.00	0.00	4.58	0.00		PCC Site - Keadby 2 Sail Storage Area. Parcel 151 & 152.	
4	Urban	Developed land; sealed surface	0.52	V.Low	N/A - Other	Within area formally identified in local strategy	Compensation Not Required	0.00		0.52	0.00	0.00	0.00	0.00		Car park by North Pilfrey Bridge, to be broken out and re-seeded. Parcel 82 (part).	
5	Woodland and forest	Wet woodland	0.06	High	Moderate	Within area formally identified in local strategy	Same habitat required	0.83	0.06		0.83	0.00	0.00	0.00		PCC Site - Retained scrub habitat connecting to adjacent wet woodland and treated as such.	
6	Grassland	Modified grassland	1.73	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	6.92	0.91		3.64	0.00	0.82	3.28		PCC Site - Powerline wayleave. Parcel 26, 27, 41, 42, 43 & 44	
7	Heathland and shrub	Hawthorn scrub	0.29	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat	1.16	0.15		0.60	0.00	0.14	0.56		PCC Site - Dense hawthorn scrub. Parcel 21, 22 & 23	
8	Urban	Open Mosaic Habitat on Previously Developed Land	0.26	High	Fairly Poor	Within area formally identified in local strategy	Same habitat required	2.69	0.01		0.10	0.00	0.25	2.59		PCC Site - Existing disturbed ground coinciding with access route for vehicles into ash tip. Nominally (given connected), but trivial, part of OMH in main ash tip. Some botanical interest but value limited by use for access. Contributes negligibly to the invertebrate interest of the main ash tip, substrate compacted. Parcel 102 & 106.	
9	Heathland and shrub	Mixed scrub	0.09	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.36			0.00	0.00	0.09	0.36		PCC Site - Dense scrub adjacent to K2 car park. Diverse, but dense with even age structure. No glades or clearings, no tall herb fringe (straight into ephemeral). Parcel 16.	
10	Heathland and shrub	Hawthorn scrub	0.31	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat	1.24	0.22		0.88	0.00	0.09	0.36		PCC Site - Location of electrical connection. Parcel 24	
11	Grassland	Modified grassland	5.49	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	12.63	2.29	0.6	5.27	1.38	2.60	5.98		Grassland along permanent access road. Habitat creation area (excluding area to be converted to scrub see line 20), 2.6 ha required for construction laydown (Area 2 on Construction Laydown Area Plan). Parcel 52.	
12	Grassland	Modified grassland	0.22	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.51			0.00	0.00	0.22	0.51		A18 widening - assume worst case (all verge in red line on north side of carriageway). Species-poor grassland affected by highways regimes. Parcel 71, 72, 73	
13	Cropland	Cereal crops	10.43	Low	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	20.86			0.00	0.00	10.43	20.86		Arable field being used for laydown next to North Pilfrey Bridge. Parcel 89	
14	Cropland	Cereal crops	1.5	Low	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	3.00	1.5		3.00	0.00	0.00	0.00		Other arable farmland unaffected by development. Parcels 87, 88, 90-93	
15	Heathland and shrub	Bramble scrub	0.04	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat	0.16			0.00	0.00	0.04	0.16		Alternative AIL Route (parcel 25). Default condition is Poor.	
16	Grassland	Other neutral grassland	1.48	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat	5.92	0.61	0.7	2.44	2.80	0.17	0.68		Alternative AIL Route. Parcel 29	
17	Urban	Introduced shrub	0.03	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.07	0.03		0.07	0.00	0.00	0.00		Ornamental planting unaffected by development.	

	Habitats and areas			Distinctiveness	Condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comments	
Ref	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Condition	Strategic significance		Total habitat units	Area retained	Area enhanced	Baseline units	Baseline units enhance	Area lost	Units lost		Assessor comments	Reviewer comments
18	Sparsely vegetated land	Ruderal/Ephemeral	0.32	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.74	0.32		0.74	0.00	0.00	0.00		Weedy vegetatation established in ruderal/disturbed settings. Not affected by development.	
19	Urban	Developed land; sealed surface	25.59	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Compensation Not Required	0.00	25.59		0.00	0.00	0.00	0.00		Existing hardstanding and buildings.	
20	Grassland	Modified grassland	0.3	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.60		0.3	0.00	0.60	0.00	0.00		Grassland along permanent access road to be converted to scrub.	
21	Heathland and shrub	Bramble scrub	0.17	Medium	Poor	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.78	0.17		0.78	0.00	0.00	0.00		Existing scrub by canal. Not affected by development.	
22	Heathland and shrub	Mixed scrub	0.1	Medium	Poor	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.46	0.1		0.46	0.00	0.00	0.00		Various locations, not affected by development.	
23	Heathland and shrub	Hawthorn scrub	0.02	Medium	Poor	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.09	0.02		0.09	0.00	0.00	0.00		By Trent Road, not affected by development.	
24	Grassland	Modified grassland	0.08	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.18			0.00	0.00	0.08	0.18		On Alternative AIL Route. Parcel 154, 160	
25	Grassland	Modified grassland	0.16	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.37			0.00	0.00	0.16	0.37		PCC Site - Keadby Common. Parcel 66	
26	Grassland	Modified grassland	0.41	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.94			0.00	0.00	0.41	0.94		PCC Site - Keadby Common. Parcel 69, 40	
27	Grassland	Modified grassland	0.99	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.98	0.99		1.98	0.00	0.00	0.00		Various locations, not affected by development.	
28	Grassland	Modified grassland	3.13	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	7.20	3.1	0.03	7.13	0.07	0.00	0.00		Various locations, not affected by development. Area to be enhanced is by Trent Road.	
29	Woodland and forest	Other woodland; broadleaved	0.54	Medium	Moderate	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	4.97	0.51		4.69	0.00	0.03	0.28		Plantations by Chapel Lane and Trent Road.	
30	Urban	Urban Tree	0.0326	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.26	0.0245		0.20	0.00	0.01	0.06		8 semi-mature mainly native trees by Trent Road. Two ash trees to be lost. Age precludes Good condition.	

Keadby 3 Carbon Capture Power Station

A-2 Site Habitat Creation

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Post development/ post intervention habitats												
Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness	Condition	Strategic significance	Temporal multiplier		Difficulty	Habitat units delivered	Comments	
			Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/year	Final difficulty of creation		Assessor comments	Reviewer comments
Urban	Developed land; sealed surface	12.05	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	4	Medium	0.00	Remainder of previously vegetated land in PCC site is assumed to be permanent loss. At detailed design more soft landscaping may be possible within PCC.	
Grassland	Other neutral grassland	3.3	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Check details- Delay in starting habitat in required condition?	9	Low	19.16	Creation of new grassland at PCC Site, Parcels C4. Larger area may be possible (up to 4.7ha). Pending detailed design, precautionary position taken.	
Urban	Urban Tree	0.163	Medium	Fairly Poor	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	19	Low	0.57	Four native broad-leaved trees to be planted by Trent Road. Condition set to the maximum deliverable in a 30 year period (Fairly Poor), but trees will continue to mature with time so condition will improve further.	
Woodland and forest	Other woodland; broadleaved	0.03	Medium	Moderate	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	19	Low	0.14	Replacement plantings at reinstatement of habitat affected by A1L Route. Parcel C5.	
Grassland	Other neutral grassland	2.6	Medium	Moderate	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	9	Low	17.36	Grassland used for temporary laydown area 2c, reinstated and enhanced. Parcel C7.	
	Total area	28.95							56.27		

Keadby 3 Carbon Capture Power Station

A-3 Site Habitat Enhancement

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Change in broad habitat type detected. Check compliance with

Part development/ part intervention habitats																
Baseline habitats		Prepared Habitat (Pre-Populated but can be overridden)		Change in distinctiveness and condition		Area (hectares)	Distinctiveness	Condition	Strategic significance	Temporal risk multiplier		Difficulty risk	Habitat units delivered	Comm	
Baseline ref	Baseline habitat	Prepared Broad Habitat	Prepared habitat	Distinctiveness change	Condition change				Strategic significance	Standard or adjusted time to target condition	Final time to target conditionmdy	Final difficulty of		Assessor commentr	
4	Urban - Developed land; sealed surface	Grassland	Other neutral grassland	V.Low - Medium	Lower Distinctiveness Habitat - Moderate	0.52	Medium	Moderate	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	14	Low	2.91	Parcel C6. Car park to be broken out and reroun next to North Pilfrey Bridge.	
11	Grassland - Modified grassland	Grassland	Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat -	0.6	Medium	Moderate	Within area formally identified in local	Check details- Delay in starting	14	Low	3.89	Existing retained grassland along	
15	Grassland - Other neutral grassland	Grassland	Other neutral grassland	Medium - Medium	Poor - Moderate	0.7	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Check details- Delay in starting habitat in required condition?	14	Low	4.50	Retained grassland in Parcel C2, to be brought into active management to raise condition.	
21	Grassland - Modified grassland	Heathland and shrub	Mixed scrub	Low - Medium	Lower Distinctiveness Habitat - Fairly Poor	0.3	Medium	Fairly Poor	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	7	Low	1.77	Parcels C8 & C9 at Mabey Bridge and North Pilfrey Bridge respectively	
21	Grassland - Modified grassland	Woodland and forest	Other woodland; broadleaved	Low - Medium	Lower Distinctiveness Habitat - Moderate	0.03	Medium	Moderate	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	19	Low	0.17	Extension of existing plantation by Trent Road. Parcel C10	
						2.15							13.24		

B-1 Site Hedge Baseline

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	UK Habitats – existing habitats			Habitat distinctiveness	Habitat condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Comments	
Baseline ref	Hedge number	Hedgerow type	Length KM	Distinctiveness	Condition	Strategic significance		Total hedgerow units	Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost	Assessor comments	Reviewer comments
1		Native Hedgerow - Associated with bank or ditch	0.039	Medium	Good	Within area formally identified in local strategy	Like for like or better	0.54	0.039		0.54	0.00	0.00	0.00	Unaffected hedgerows adjacent to existing AIL route constructed for Keadby 2 Power Station. Not relevant to Proposed Development assume Good condition.	
2		Native Hedgerow with trees	0.25	Medium	Moderate	Within area formally identified in local strategy	Like for like or better	2.30	0.25		2.30	0.00	0.00	0.00	Unaffected existing hedgerow adjacent to Trent Road. Fails on height (criteria A1 – <1.5m tall) and width (A2 – <1.5m width).	
3		Native Species Rich Hedgerow	0.9	Medium	Poor	Within area formally identified in local strategy	Like for like or better	4.14	0.9		4.14	0.00	0.00	0.00	Unaffected young planting still in tree tubes next to permanent access route off A18. Mixed native species. Fails criteria A1(<1.5m tall), A2 9<1.5m wide), B1(as still in tubes), B2 (still very gappy, shrubs yet to merge), C1(road verge regularly mown),	
4																
5																
6																
7																
8																
			1.19					6.98	1.19	0.00	6.98	0.00	0.00	0.00		

B-2 Site Hedge Creation

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	Proposed habitats			Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty risk multipliers	Hedge units delivered	Comments	
Baseline ref	New hedge number	Habitat type	Length km	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation		Assessor comments	Reviewer comments
1		Native Species Rich Hedgerow	0.5	Medium	Poor	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	5	Low	1.92	Extension to existing hedgerow adjacent to permanent access route off A18. Condition likely to be Moderate within 5 years but this is not overstated for purposes of the assessment as requirements to maintain an oversail for large deliveries to the existing wind farm may limit the height of the new hedgerow. Therefore the minimum commitment is to achieve a hedgerow comparable to that already present.	
2												
3												
4												
5												
6												
			0.50							1.92		

C-1 Site River Baseline

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Existing river type			Habitat distinctiveness	Habitat condition	Strategic significance			Watercourse encroachment		Riparian encroachment		Suggested action	Ecological baseline	Retention category biodiversity value						Co
Baseline ref	River type	Length KM	Distinctiveness	Condition	Strategic significance	Strategic significance	Strategic position multiplier	Extent of encroachment	Multiplier	Extent of encroachment	Multiplier		Total river units	Length retained	Length enhanced	Units retained	Units enhanced	Length Lost	Units Lost	Assessor Comments
1	Canals	0.145	Medium	Poor	Within Local Plans	High strategic significance	1.15	Minor	0.8	Major	0.75	Restore	0.40	0	0.132	0.00	0.36	0.01	0.04	Stainforth and Keadby Canal - Section affected by intake structure within channel: 13.25m = 0.013km. Extends 3m out into watercourse * 34.5m wide, therefore minor watercourse encroachment. No riparian encroachment as the development occupi existing built footprint.
2	Other Rivers and Streams	0.313	High	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	Major	0.75	Restore	3.24	0.102	0.075	1.06	0.78	0.14	1.41	Hatfield Waste Drain - Existing bridge represents major encroachment in riparian zone. The bridge w be replaced but with a minor (2m) increase in width. Extent of earthworks for Highways improveme (4.6 Highway Works Plan) is 136m = 0.136km.
3	Ditches	0.476	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	4.38	0.461	0	4.24	0.00	0.02	0.14	PCC Site Drain 1 - Glew Drain. 15m bank top habitat loss for emergency access bridge = 0.015km.
4	Ditches	0.418	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.92	0	0.418	0.00	1.92	0.00	0.00	PCC Site Drain 2
5	Ditches	0.284	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.31	0	0.284	0.00	1.31	0.00	0.00	PCC Site Drain 3
6	Ditches	0.379	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.74	0	0	0.00	0.00	0.38	1.74	PCC Site Drain 4
7	Culvert	0.037	Low	Poor	Low potential/action not identified	Low Strategic	1	N/A - Culvert	1	No	1	Restore	0.07	0.037	0	0.07	0.00	0.00	0.00	PCC Site Drain 4 - existing culvert
8	Ditches	0.087	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.40	0	0.087	0.00	0.40	0.00	0.00	PCC Site Drain 5
9	Culvert	0.005	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.01	0.005	0	0.01	0.00	0.00	0.00	PCC Site Drain 2 - existing culvert
10																				Drain 6 - removed from Metric (does not exist)
11																				Drain 6 - existing culvert - removed from Metric (doe not exist)
12	Ditches	0.067	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.31	0.067	0	0.31	0.00	0.00	0.00	Drain 7
13																				Drain 8 - deleted from Metric (no longer exists)
14	Ditches	0.154	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.71	0.154	0	0.71	0.00	0.00	0.00	Drain 9
15	Culvert	0.041	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.08	0.041	0	0.08	0.00	0.00	0.00	Drain 9 - existing culvert
16	Ditches	0.308	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.42	0.308	0	1.42	0.00	0.00	0.00	Drain 10
17	Culvert	0.05	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.10	0.05	0	0.10	0.00	0.00	0.00	Drain 10 - existing culvert

C-1 Site River Baseline

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Existing river type			Habitat distinctiveness	Habitat condition	Strategic significance			Watercourse encroachment		Riparian encroachment		Suggested action	Ecological baseline	Retention category biodiversity value						Co
Baseline ref	River type	Length KM	Distinctiveness	Condition	Strategic significance	Strategic significance	Strategic position multiplier	Extent of encroachment	Multiplier	Extent of encroachment	Multiplier		Total river units	Length retained	Length enhanced	Units retained	Units enhanced	Length Lost	Units Lost	Assessor Comments
18	Ditches	0.26	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.20	0.26	0	1.20	0.00	0.00	0.00	Drain 11
19	Culvert	0.011	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.02	0.011	0	0.02	0.00	0.00	0.00	Drain 11 - existing culvert
20	Ditches	0.547	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	5.03	0.547	0	5.03	0.00	0.00	0.00	Drain 12
21	Culvert	0.013	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.03	0.013	0	0.03	0.00	0.00	0.00	Drain 12 - existing culvert
22	Ditches	0.051	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.47	0.051	0	0.47	0.00	0.00	0.00	Drain 13
23	Ditches	0.012	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.11	0.012	0	0.11	0.00	0.00	0.00	Drain 14
24	Culvert	0.014	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.03	0.014	0	0.03	0.00	0.00	0.00	Drain 14 - existing culvert
25	Ditches	0.014	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.13	0.014	0	0.13	0.00	0.00	0.00	Drain 15
26	Culvert	0.017	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.03	0.017	0	0.03	0.00	0.00	0.00	Drain 15 - existing culvert
27	Ditches	0.025	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.23	0.025	0	0.23	0.00	0.00	0.00	Drain 16
28	Ditches	0.025	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.23	0.025	0	0.23	0.00	0.00	0.00	Drain 17
29	Ditches	0.02	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.18	0.02	0	0.18	0.00	0.00	0.00	Drain 18
30	Ditches	0.009	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.08	0.009	0	0.08	0.00	0.00	0.00	Drain 19
31	Culvert	0.008	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.02	0.008	0	0.02	0.00	0.00	0.00	Drain 19- existing culvert
32	Ditches	0.063	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.58	0.063	0	0.58	0.00	0.00	0.00	Drain 20
33	Ditches	0.39	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.79	0.39	0	1.79	0.00	0.00	0.00	Drain 21
34	Culvert	0.045	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.09	0.045	0	0.09	0.00	0.00	0.00	Drain 21 - existing culvert
35	Ditches	0.016	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.15	0.016	0	0.15	0.00	0.00	0.00	Drain 22
36	Culvert	0.011	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.02	0.011	0	0.02	0.00	0.00	0.00	Drain 22 - existing culvert
37																				
38																				
39																				
40																				
41																				
		4.32											26.51	2.78	1.00	18.42	4.77	0.54	3.32	

C-2 Site River Creation

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	Proposed habitats		Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty multipliers	Watercourse encroachment	Riparian encroachment	River units delivered	Comments	
Baseline ref	River type	Length km	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation	Extent of encroachment	Extent of encroachment		Assessor comments	Reviewer comments
1	Canals	0.013	Medium	Poor	Delivery within Local Plans	Standard time to target condition applied	1	Low	Minor	Major	0.03	Stainforth and Keadby Canal. While there is an impact from the Proposed Development within the channel there is no loss of watercourse length and the impact is very small scale and therefore it will not materially alter the existing baseline condition and encroachment.	
2	Other Rivers and Streams	0.136	High	Moderate	Delivery within Local Plans	Standard time to target condition applied	5	High	No Encroachment	Major	0.39	Hatfield Waste Drain – replacement of bridge 14.6m wide, therefore 2m increase in width relative to the current bridge. Does not meet defintion of encroachment in guidance, but location of impact requires major impact to be recorded even though very small scale.	
3	Ditches	0.015	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	5	Low	No Encroachment	No Encroachment	0.12	Drain 1 (Glew Drain). As the works are very small scale there are no implications for nature conservation value, function or integrity of the drain. Therefore the works are insufficient to materially alter the condition of the drain in terms of the site condition assessment criteria.	
4													
5													
6													
7													
8													
		0.16									0.54		

C-3 Site River Enhancement

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	Baseline habitats		Post development/ post intervention habitats													Comments	
Baseline ref	Baseline habitat	Proposed River Type (Pre-populated can be overridden)	Change in distinctiveness and condition		Length KM	Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty multipliers	Watercourse encroachment	Riparian encroachment	River units delivered	Assessor comments	Reviewer comments
			Distinctiveness movement	Condition movement		Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of enhancement	Extent of encroachment	Extent of encroachment			
1	Canals	Canals	Medium - Medium	Poor - Fairly Good	0.132	Medium	Fairly Good	Delivery within Local Plans	Standard time to target condition applied	6	Medium	No Encroachment	No Encroachment	1.10	Stainforth and Keadby Canal - marginal planting within full length of red line	
2	Other Rivers and Streams	Other Rivers and Streams	High - High	Moderate - Fairly Good	0.075	High	Fairly Good	Delivery within Local Plans	Standard time to target condition applied	2	Medium	No Encroachment	No Encroachment	1.20	Hatfield Waste Drain - bank top planting of scrubby woodland	
4	Ditches	Ditches	Medium - Medium	Poor - Moderate	0.418	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	4	Medium	No Encroachment	No Encroachment	3.04	Drain 2 enhancements (ditches can only be poor, moderate or good condition)	
5	Ditches	Ditches	Medium - Medium	Poor - Moderate	0.284	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	4	Medium	No Encroachment	No Encroachment	2.07	Drain 3	
8	Ditches	Ditches	Medium - Medium	Poor - Moderate	0.087	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	4	Medium	No Encroachment	No Encroachment	0.63	Drain 5	
					1.00									8.03		

~~APPENDIX D~~APPENDIX E ARBORICULTURAL REPORT

CONTENTS

ANNEXES

TABLES

1.0 INTRODUCTION

1.1 Background

1.1.1 AECOM has been instructed by SSE Thermal (The Applicant) to carry out an Arboricultural Impact Assessment of the development proposals within or immediately adjacent to a proposed additional abnormal indivisible loads (AIL) Route haul road through Keadby Power Station (hereafter referred to as 'the Site' and 'Proposed Development) in support of a planning application. This report identifies the likely direct and indirect impacts of the Proposed Development Change 2 along with suitable mitigation measures, as appropriate. The Tree Protection Plan (included within Appendix C) identifies trees to be removed and how retained trees are to be successfully protected.

1.2 Trees and the Planning Process

1.2.1 The National Planning Policy Framework (NPPF) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses a recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaption. The NPPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity. Finally it specifically identifies veteran and ancient trees and woodland as a highly valuable and irreplaceable habitat.

1.2.2 Local Planning Authorities (LPA) in the UK have a statutory duty to consider both the protection and planting of trees when considering planning applications. The potential impact of development on all trees (including those not protected by a Tree Preservation Order or other statutory designation) is therefore a material consideration.

1.2.3 '*BS5837:2012 Trees in relation to design demolition and construction – Recommendations (BS5837)*' provides a framework which sets out how trees should be considered in this context and also explicitly applies to development where planning consent is not required.

1.2.4 BS5837 recommends that a tree survey is undertaken to identify the quality and benefits of trees and the spatial constraints associated with them. This is then used to produce a Tree Constraints Plan showing the above and below ground constraints associated with trees. This drawing is used to inform the design process and to allow the retention of good quality trees where appropriate.

1.2.5 An Arboricultural Impact Assessment is then developed to identify the likely direct and indirect impacts of the Proposed Development, and a Tree Protection Plan is prepared to identify trees to be removed or retained and to illustrate how retained trees are to be protected. An Arboricultural Method Statement is often required as a condition of planning consent to detail how sensitive operations are to be achieved in close proximity to retained trees. These elements are the

minimum normally required for a planning application and are intended to ensure both a sustainable and harmonious relationship between trees and new development.

Local Policy Context

1.2.6 North Lincolnshire Council has a statutory duty to consider tree retention and new planting when assessing planning applications. The North Lincolnshire Council Core Strategy[1] was adopted in June 2011. Its sets out the long-term strategic policies for North Lincolnshire's future development and will form the framework against which planning applications will be assessed.

1.2.7 Policy CS16: North Lincolnshire's landscape, greenspace and waterscape states that the council will protect, enhance and support a diverse and multi-functional network of landscape, greenspace and waterscape through:

1. *Identifying in supporting documents within or evidencing the Local Development Framework, a network of strategically and locally important landscape, greenspace and waterscape areas. Development on or adjacent to these areas will not be permitted where it would result in unacceptable conflict with the function(s) or characteristic of that area.*

2. *Requiring development proposals to improve the quality and quantity of accessible landscape, greenspace and waterscape, where appropriate.*

3. *Requiring development proposals to address local deficiencies in accessible landscape, waterscape and greenspace where appropriate.*

4. *Requiring the protection of trees, hedgerows and historic landscape to be specified where appropriate.*

The creation and maintenance of the network of landscape, green space and waterscapes will be secured by a range of measures, including protecting open space, creating new open spaces as part of new development, and by using developer contributions to create, improve and maintain green infrastructure assets where appropriate.

Within policy CS5: Delivering quality design in North Lincolnshire it states that the council will incorporate appropriate landscaping and planting which enhances biodiversity or geological features whilst contributing to the creation of a network of linked greenspaces across the area. Tree planting and landscaping schemes can also assist in minimising the impacts of carbon emissions upon the environment.

Section 11.10 includes the aim of the Core Strategy which is to protect and enhance North Lincolnshire's natural heritage and world class landscapes and habitats by maintaining and creating a sensitive balance between urban and

[1] [redacted]

rural, built form and natural assets, and physical and cultural links between townscape and landscape. It also notes that North Lincolnshire has particularly low levels of tree cover and tree planting will need to be substantially increased, without compromising individual landscape character types, within the area. Increasing tree cover within accessible natural green space close to the main urban areas including settlements and the large South Humber Bank employment site will promote a range of environmental, social and health benefits.

Section 11.37 shows the importance of smaller scale greenspace features which include individual trees and hedgerows are also important to quality of life and the environment. The council will be proactive in protecting such features through Tree Preservation Orders or other applications of its powers. Development proposals should also bring forward landscaping schemes that protect existing landscape features and deliver environmental improvements appropriate to the location of the scheme and the function and scale of development.

1.3 Methodology

1.3.1 The tree survey has been based on available Ordnance Survey (OS) base mapping and trees have been plotted indicatively with reference to on site Global Positioning System (GPS), site features and publicly available aerial photography. Such trees have been marked with an '*' on the Tree Constraints Plan included as Annex A and within the Tree Survey Schedule included as Annex B. As such all positions for these trees must be considered to be indicative only and the relative distances of features must be measured out on the Site as required.

1.3.2 The survey was otherwise conducted in accordance with the requirements of *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837)*.

1.3.3 The initial fieldwork was undertaken in February 2022 during which dimensional data and observational information were collected. A diameter tape measure was used to measure stem diameters where feasible.

1.3.4 The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the Site.

1.3.5 Where further inspection is deemed appropriate to ascertain the condition of the tree or other arboreal features, this has been identified within the preliminary management recommendations. Average dimensions or dimensional ranges have occasionally been used, where appropriate, to best describe features.

1.3.6 A Tree Constraints Plan showing the position of trees and the spatial constraints associated with them is included as Annex A of this report, which corresponds with the Tree Survey Schedule presented in Annex B.

1.3.7 The tree categorisation process recommended by BS5837:2012 is summarised in the table below and corresponds with the tree canopy outline shown on the tree constraint plan included as Annex A and the information in the Tree Survey Schedule included as Annex B.

Table 1: BS5837:2012 Tree Categorisation process

Category	Definition
A	High quality, minimum of 40+ years remaining contribution
B	Moderate quality, minimum of 20+ years remaining contribution
C	Low quality, minimum of 10+ years remaining contribution
U	Unsuitable for retention, <10 years remaining contribution
1	Arboricultural value
2	Landscape value
3	Conservation or cultural value

2.0 GENERAL ARBORICULTURAL PRINCIPLES

2.1 General Principles

2.1.1 Trees are dynamic living organisms which provide essential benefits to society and the wider environment. Any Proposed Development with the potential to impact on trees must take into consideration the value of trees on Site; the impact of any proposed activity along with any potential future conflicts on the Site. Suitable measures to safeguard retained trees or mitigate the loss of trees (to be removed) will need to be fully considered and may be subject to a condition of planning consent.

2.1.2 Tree branches and roots frequently grow across site boundaries and off site trees can pose a significant constraint, and should be carefully considered when assessing the developable space within a site.

2.2 Below Ground Constraints

2.2.1 Below ground tree roots and the soil environment in which they grow need to be protected if the tree is to be retained. Trees grow in association with fungi and other soil organisms which are of key importance to tree health. Roots are essential for anchorage, the uptake of water and nutrients, and the storage of energy (carbohydrates) for the future growth and function of the tree.

2.2.2 Roots can be damaged by physical severance or wounding (e.g. following excavation of the soil) which can lead to the development of decay and a decline in vitality and/or instability. Raising the soil level can bury tree roots at a depth where suitable conditions for growth are less available. Toxic materials discharged into the soil (such as cement based aggregates, fuel and chemicals) can lead to root death and dysfunction. Soils can be compacted to levels inhospitable to tree growth with even a single pass of machinery, regular pedestrian traffic or the storage of plant and materials. Relieving compaction can be problematic and may require costly remedial works. Changes in drainage/water levels can also have significant long term impacts for tree health.

2.2.3 The effects of these incursions may take many years to manifest, with a resulting decline in amenity value and potentially the death or failure of the tree. It should be noted that older trees are particularly sensitive to damage and changes in conditions.

2.2.4 The Root Protection Area (RPA) is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. This area is deemed to be particularly important for tree stability, growth, function and health. However, roots may extend far greater distances, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients). It is generally accepted that tree roots are predominantly located in the upper 1000mm of soil; however, roots may develop at deeper levels where conditions allow.

2.2.5 RPAs are calculated as per BS5837: 2012 Annexes C, D and Section 4.6 in the BS 5837 2012 Document.

2.2.6 The RPA of the existing tree stock is an important material consideration when considering site constraints and planning development activities. The RPA of significant trees on Site is shown on the Tree Constraints Plans included as Annex A.

2.2.7 The default position must be that all development, including any associated services will occur outside the RPAs of retained trees. Where this is unavoidable, it may be appropriate to use special measures to install structures, services or surfacing within RPAs which allow the protection of roots and soil structure which are essential for tree growth and keep any incursion to a minimum.

2.2.8 Further steps to improve or increase the useable rooting area available to the tree may also be required.

2.3 Soils

2.3.1 AECOM accessed the Geology of Britain Viewer[2] on 1st March 2022. Site bedrock was identified as mudstone with superficial deposits of clay and silt.

2.3.2 Following a review of Landis soilscapes[3] on 1st March 2022 the soils on the Site were described as loamy and clayey soils of coastal flats with naturally high groundwater.

2.3.3 On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations must be installed following the recommendations of National House Building Council (NHBC) Standards *Chapter 4.2: Building Near Trees* (2021) to avoid potential future damage. Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet.

2.3.4 The advice of a suitably qualified engineer must be obtained to inform any potential issue of heave. Specific advice in relation to this issue is beyond the scope of this report.

2.4 Above Ground Constraints

2.4.1 Tree stems and branches can restrict available space on a site. Damage or wounding (including excessive pruning) can significantly reduce the amenity contribution of the tree and may lead to the development of dysfunction and

2 [redacted]

3 [redacted]

decay, with significant long term implications for tree health. The future impact of existing trees should be carefully considered, including individual species characteristics (such as potential future size, fruit fall, shade etc.) and how the tree will interact with any proposed development and future land use. Annual tree growth can lead to direct damage if stems/branches (or roots) come into physical contact with structures and this must also be taken into consideration.

2.5 Trees and Risk in the Context of Development

2.5.1 Tree owners/managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate.

2.5.2 AECOM can provide surveys and advice in relation to tree risk management if required. Further guidance is available from the National Tree Safety Group[4].

2.5.3 The tree survey carried out as the basis of this report is primarily for planning purposes, focusing on the quality and benefits of the trees and is not specifically designed to assess the safety of trees on Site. However, when obvious issues have been identified recommendations have been included in the Tree Survey Schedule.

2.5.4 The Construction (Design and Management) Regulations (2015) states that developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition the Health and Safety Executive (HSE) could seek to prosecute those responsible along with the potential for further Civil claims for damages.

2.6 Trees and Wildlife

2.6.1 Full consideration must be given to the presence of species protected under the Wildlife and Countryside Act (1981 - as amended), the Countryside Rights of Way Act (2000) and the Conservation of Habitats and Species Regulations (2017). In particular the presence of bats and nesting birds. It is recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September.

2.7 Tree Works

2.7.1 Any tree surgery recommendations contained within this report are to be undertaken in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) by suitably qualified and insured contractors. Significant pruning works are best undertaken when trees are dormant or outside periods of high functional activity to reduce the overall impact on energy available to the tree for growth and processes. In general the optimum period for works is between

[4] National Tree Safety Group (NTSG),2011. Common sense risk management of trees. Forestry Commission.

November to February and July to August (subject to the presence of protected species) when the tree is less active and better placed to respond to wounding and a reduction in leaf area.

3.0 FIELD WORK OBSERVATIONS

3.1 The Site

3.1.1 The Site is located in Keadby 2 Power station at Trentside, Keadby, Scunthorpe, DN17 3EF.

3.1.2 The Site is occupied by a large power station complex with on-site parking facilities to the eastern side of the Site. To the north east of the Site there is a small area of woodland. Within the power station there is little tree cover with the majority of trees being located on the outer boundaries of the Site.

3.2 The Trees

3.2.1 There are a total of 19 tree features included in the survey including 12 individual trees, six tree groups and one woodland group.

3.2.2 The trees on the Site are predominantly semi mature in age and in fair to good condition. Species present include pin oak (*Quercus palustris*), pine (*Pinus sp*), aspen (*Populus tremula*), cherry (*Prunus sp.*), field maple (*Acer campestre*), common oak (*Quercus robur*), ash (*Fraxinus excelsior*), Scots pine (*Pinus sylvestris*), Norway maple (*Acer platanoides*), willow (*Salix sp.*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), Turkish hazel (*Corylus colurna*), Lawson cypress (*Chamaecyparis lawsoniana*), common alder (*Alnus glutinosa*) and London plane (*Platanus x acerifolia*).

3.2.3 The most significant trees included within the survey are W9, a small woodland group located in the north eastern corner of the Site, T3 a large common oak located along an access road and T18 and T19 which are two adjacent London planes situated near the Site entrance.

3.2.4 Many of the trees on Site have been previously topped; removing the entirety of the tree's crown in some cases. This can lead to the development of decay and dysfunction. Trees typically respond with extensive regrowth which may be more weakly attached and will likely require ongoing cyclical remedial works to maintain the tree canopy in an acceptable condition.

3.2.5 T15 and T16 are two large willows located north of the entrance access road, both have previously been topped resulting in poor forms and multiple large pruning wounds with pockets of decay.

3.2.6 T3 has good future potential but has barbed wire placed around its lower stem which if not removed may result in stem defects in the future.

3.3 Statutory and Non Statutory Designations

3.3.1 AECOM checked the North Lincolnshire Council website[5] on 1st March 2022 and there were no Tree Preservation Orders or Conservation Area designations identified which could affect trees within or immediately adjacent to the Site.

3.3.2 The Hedgerows Regulations (1997) protect agricultural or countryside hedgerows which meet the requirements of an 'important hedgerow'. These include a minimum length of 20m (or meets another hedge at each end) and a minimum age of at least 30 years. A wide range of other ecological and archaeological/heritage features can constitute an important hedgerow and further advice from a qualified ecologist is recommended in advance of any planned works which could impact established hedgerows on or bordering agricultural or countryside land. Prior to the removal or destruction of a protected hedgerow an application must be made to the Local Planning Authority. Full planning consent is an exemption to this requirement.

3.3.3 A felling licence may be required by the Forestry Commission to fell more than $5m^3$ in any calendar quarter (subject to relevant exceptions including trees in gardens, designated public open spaces or churchyards).

3.3.4 Full planning consent is an exemption from the need to apply for consent for works to trees protected by a Tree Preservation Order, the need to give notice of the intention to undertake works within a Conservation Area and the need to apply for a Felling Licence with the Forestry Commission (to fell more than $5m^3$ per calendar quarter). Prior to any tree works the status of trees to be removed or pruned must be verified with North Lincolnshire Council and the Forestry Commission as appropriate.

3.3.5 Following a review of Magic Map[6] it was found that the River Trent is classed as a Site of Special Scientific Interest. Although it is not within or immediately adjacent to the Site, it should be noted that the Site is within a SSSI Impact Risk Zone which allows Natural England to make a rapid initial assessment of the potential risks posed by development proposal. There is also a Priority Habitat Deciduous Woodland to the south east of the Site (see below screenshot), this is a non-statutory designation which has the potential to be a material consideration in the planning process.

5 [redacted]
6 [redacted]

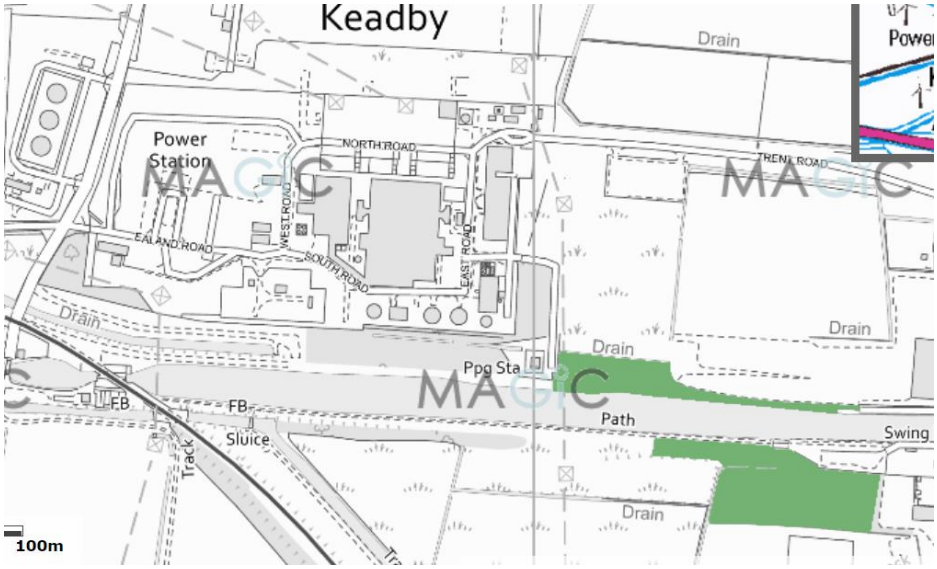


Figure 1: Priority Habitat Deciduous Woodland location (Green)

3.3.6 The Woodland Trust Ancient Tree Inventory[7] was checked in February 2022 and no trees within or in proximity to the Site have been recorded within the inventory as of ancient, veteran or notable status.

7 [redacted]

4.0 THE PROPOSED DEVELOPMENT

4.1.1 The Proposed Development is detailed on the ES_Addendum_AIL-Route_20220315 Plan which is overlaid on the Tree Protection Plan included as Annex D and includes a new access haul road through Keadby Powerstation.

5.0 ARBORICULTURAL IMPACT ASSESSMENT

5.1 Purpose

5.1.1 This impact assessment sets out the likely principal direct and indirect impacts of the Proposed Development on the trees on or immediately adjacent to the Site and suitable mitigation measures to allow for the successful retention of significant trees or to compensate for trees to be removed, where appropriate.

5.1.2 A brief summary of trees to be removed, tree works and incursions related to the Proposed Development are detailed within the table below.

Table 2: Summary of Removals, Incursions and Pruning to Facilitate the Proposed Development

Impact	Category A	Category B	Category C	Category U
Trees to be removed to facilitate the Proposed Development	-	T3, W9 (part of)	G1, G2, G4, T10, G11, G12, T13, T14, G17 (part of)	T15
Total	**-**	**1 tree, part of 1 woodland group**	**3 individual trees, 5 groups, part of 1 group**	**1 tree**
Trees which may require some incursion into their construction exclusion zone to allow the Proposed Development.	-	W9	G17	-
Total	**-**	**1 woodland**	**1 group**	**-**
Trees to be pruned to facilitate the Proposed Development	-	-	-	-
Total	**-**	**-**	**-**	**-**

5.2 Trees to be Removed

5.2.1 Eleven tree features are to be removed or part-removed to facilitate the Proposed Development. This includes part of one woodland and one individual tree classed as moderate quality (Category B) with the three individual trees, five tree groups and part of one group classified as low quality (Category C).

5.2.2 The loss of these trees is necessary to achieve the access requirements for the Site.

5.2.3 In addition, one tree of very low quality, T15, (Category U) is also recommended for removal. This tree is arguably not suitable for long term retention and its removal is justified regardless of the Proposed Development.

5.2.4 Tree removals will be mitigated with a high quality scheme of new tree planting and associated landscaping works as detailed in the Indicative Landscape and Biodiversity Plan – Application Document Ref. 5.10 which will represent an opportunity to enhance the quality, benefits and resilience of trees on Site.

5.2.5 All of the remaining recorded trees can be retained and protected.

5.3 Tree Works

5.3.1 Tree removals to facilitate the Proposed Development are detailed in the Tree Survey Schedule included as Annex B.

5.3.2 No additional works to retained trees are likely to be required. All tree work is to follow the principles of *BS3998: 2010 Treework – Recommendations* and must be carried out by suitably qualified and insured contractors. The Arboricultural Association provides a list of contractors who meet these requirements which can be found at [redacted]

5.3.3 Should the requirement for additional tree works be identified, this will be discussed with an arboriculturist and no works will be undertaken without the consent of the Local Planning Authority (LPA).

5.4 Incursions within the RPA or Canopy Spread

5.4.1 The Proposed Development may require an incursion into the RPAs of retained sections of W9 and G17. The final extent of tree removals within these groups will be determined on site by an arboriculturist taking into account the extent of any RPA incursions required. At this stage a 1m off set from the edge of the proposed AIL haul road has been allowed for and beyond this trees will be protected by fencing. Adjacent trees may be retained where only a small proportion of their RPA is impacted by the proposed haul route. This will be assessed by an arboricuturist following initial clearance works and the setting out of the haul road footprint on site. Trees will then be protected with temporary tree protection barriers.

5.5 The Future Impact of Retained Trees

5.5.1 The retained trees are located outside of the Site boundary and will not have a significant future impact on the future use of the Site.

5.5.2 Retained trees will require periodic inspection to assess their structural condition and safety. Occasional removal of dead wood or other remedial works to address significant defects may be required in areas of frequent access. This

is unlikely to be overly onerous and will be the responsibility of the tree owner. This will not represent a significant change from the current situation on Site.

5.5.3 All tree works recommended as a result of the preliminary tree survey of the Site which considered trees in the context of the current use of the Site (these works are included as preliminary management recommendations in the Tree Schedule in Annex B of this report) should be actioned within the recommended timescales.

5.6 Tree Protection

5.6.1 Retained trees are vulnerable to damage from construction activities which can include physical damage to stems and branches following impacts with plant. Root severance following trenching, root death or dysfunction following damage to soil structure (caused by the movement of people or machinery on unsurfaced ground) or via the spillage of materials toxic to tree health. The default position is that the RPA and Canopy spread of trees to be retained will form an effective Construction Exclusion Zone, secured with robust fencing where no access will be permitted. Where access is necessary within this area special measures such as the use of ground protection and arboricultural supervision are generally required.

5.6.2 Outline tree protection measures are considered in Annex D of this report. An Arboricultural Method Statement is often required as a condition of planning consent to set out the phasing of site operations, the finalised tree protection measures for the site and to provide detail on how sensitive elements of work are to be achieved in proximity to retained trees.

5.6.3 Issues to be addressed by the Arboricultural Method Statement are listed in the Conclusion of this report.

5.7 Site Organisation, Storage and Use of Materials, Plant and Machinery

5.7.1 All construction site facilities including site huts, staff and contractor parking and areas for storage will be located outside of the RPA or crown spread of retained trees, including those not specifically covered in this report. Space is likely to be constrained on the Site and will need to be carefully considered. The Construction Exclusion Zones identified on the Tree Protection Plan must be fully respected and their location and significance is to be highlighted to all site staff and contractors during the formal site briefing.

5.7.2 The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction sites can be toxic to tree roots (such as concrete, fuels, salts, builders sand and herbicides) and can result in the death of tree roots and beneficial soil organisms and can have a significant impact on the future health and appearance of the tree.

5.7.3 The storage of materials and arising's can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree.

5.7.4 For these reasons the storage of materials and any washing, mixing or refuelling will take place in agreed allocated areas at least 5m from the edge of the RPA of retained trees.

5.7.5 Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.

5.7.6 Particular care is required where high sided vehicles, long reach machinery and plant with jibs, booms and counterweights are to operate with in proximity to retained trees. A banksman will be used where the movement of plant or long reach machinery occurs within 5m of any part of a retained tree to ensure no damage is sustained.

5.8 Tree Planting

5.8.1 Existing areas of unsurfaced ground must be protected during the demolition and construction phases if they are to be re-used for new plantings. Protection can be achieved using fit for purpose ground protection measures as set out in BS5837:2012 Section 6.2.3 or by creating a fenced exclusion zone. Where protection is not feasible, soil amelioration or replacement works will be required to ensure suitable growing conditions for new trees to fully establish.

5.8.2 Where new trees are to be planted, the minimum planting distances detailed in Annexe A, Table A.1 of BS5837:2012 must be adhered to, to prevent direct damage to services and structures from future tree growth.

5.8.3 New tree planting should be implemented in accordance with the guidance set out in BS8545: 2014 Trees: from nursery to establishment in the landscape – Recommendations.

5.9 Services

5.9.1 No information in relation to services has been made available at this stage.

5.9.2 Where existing services become redundant within the RPA of a retained tree, the default position must be that they be decommissioned and left in situ. Where this is not feasible the following principles are to be observed.

5.9.3 Existing services are to be removed by winching out from an access/inspection chamber located outside of an RPA. It may be acceptable to fill redundant pipe work with an inert material or undertake pipe bursting where necessary within the RPA of retained trees.

5.9.4 Excavation to install services has the potential to result in unacceptable root severance which could result in instability, dysfunction or the death of trees.

Repeated incursions are particularly damaging and must be avoided by bundling services wherever possible.

5.9.5 The default position will therefore be that all services be routed outside of the RPA of retained trees. The following general principles will apply and where services must be routed within the RPA of a retained tree this process will be subject to a detailed method statement with approval from the Planning Authority. The principles of the National Joint Utilities Group (NJUG) Volume 4 guidance must be adhered to.

5.9.6 All services must be bundled as far as possible and installed within RPAs using hand/compressed air excavation (e.g. for shallow service runs) or trenchless techniques such as impact moling (thrust boring) with all access pits and inspection chambers being located outside of the RPA. The route must run as far from the main stem of a retained tree as possible and must be at a minimum depth so that the upper 1m of the soil profile is undisturbed. The depth of the run may need to be adjusted to account for soil type and species variation and this must be determined subject to the advice of an arboriculturist.

5.9.7 This operation must take place as specified in an Arboricultural Method Statement. Any water pipes must be constructed so as to be resistant to ingress by tree roots (both existing trees, and newly planted trees) which could include the use of root barriers where appropriate.

6.0 CONCLUSIONS

6.1 Conclusions

6.1.1 Eleven tree features are to be removed or part-removed to facilitate the Proposed Development, this includes part of one woodland and one individual tree classed as moderate quality (Category B) with the three individual trees, five tree groups and part of one group classified as low quality (Category C).

6.1.2 The loss of these trees is necessary to achieve the access requirements for the Site.

6.1.3 In addition, one tree of very low quality, T15, (Category U) is also recommended for removal. This tree is arguably not suitable for long term retention and its removal is justified regardless of the Proposed Development.

6.1.4 Tree loss will be mitigated with a robust and high quality scheme of new tree planting as detailed in the is Indicative Landscape and Biodiversity Plan – Application Document Ref5.10 which represents an opportunity to increase the quality, impact, diversity and resilience of the local tree stock.

6.1.5 Soil structure for areas of new tree planting where the ground is currently unsurfaced will either be protected using ground protection or fenced exclusion zones; or the soil structure will be ameliorated or replaced following the completion of construction works on Site.

6.2 Issues to be addressed by an Arboricultural Method Statement

- Conditions of planning consent
- Pre commencement meeting and site briefing
- Order and phasing of operations
- Tree works
- Tree protection fencing
- Ground protection
- Site storage and facilities
- Movement of people, plant and materials
- Installation of new surfacing
- Installation of new services and/or diversion of existing services
- Hard landscaping
- Soft Landscaping
- Removal of tree protection measures

7.0 REFERENCES

British Standards Institution (BSI), BS5837:2012. Trees in relation to design, demolition and construction – Recommendations. BSI

British Standards Institution (BSI), BS3998:2010. Tree work – Recommendations. BSI

British Standards Institution (BSI) BS8545: 2014 Trees: from the nursery to independence in the landscape - Recommendations

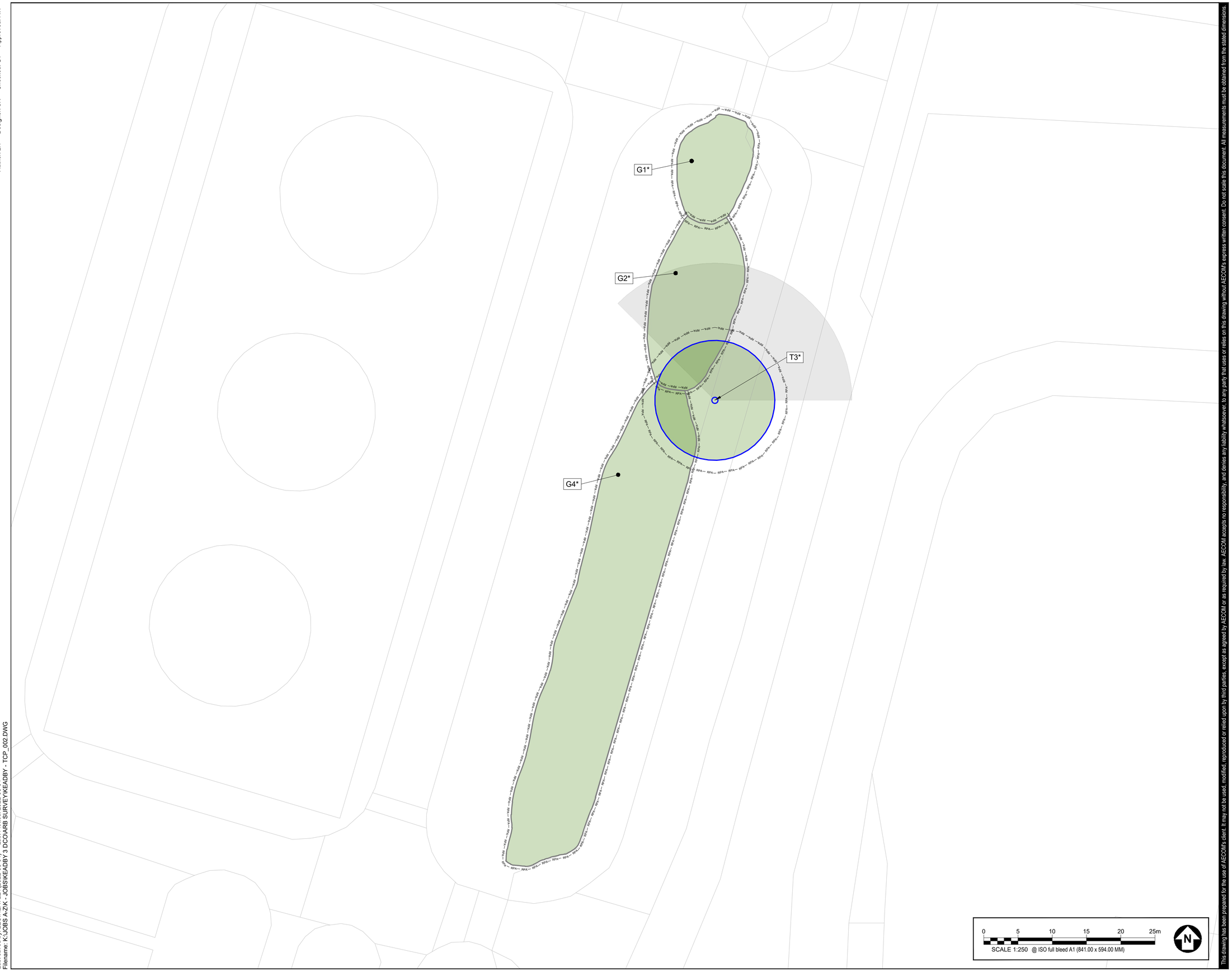
National House Building Council (NHBC) Standards, (2021). Chapter 4.2: Building Near Trees

National Joint Utilities Group (NJUG) Volume 4, Issue 2, (2007). NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

National Tree Safety Group (NTSG), 2011. Common sense risk management of trees. Forestry Commission.

Ministry of Housing, Communities and Local Government (MHCLG), 2021. National Planning Policy Framework (NPPF). MHCLG

ANNEX A TREE CONSTRAINTS PLAN



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GENERAL NOTES
1. TREE CATEGORIES AS DEFINED BY BS 5837:2012
2. TREE LOCATIONS ARE BASED ON THE TOPOGRAPHICAL SURVEY, AERIAL IMAGERY, AND GPS CO-ORDINATES FROM ON SITE WALKOVER.
3. * INDICATES A TREE / GROUP WHOSE POSITION IS APPROXIMATE AS BASED UPON AERIAL PHOTOGRAPHY AND ON SITE OBSERVATIONS.
4. PLANS SHOULD BE READ IN CONJUNCTION WITH THE AECOM ARBORICULTURAL REPORT.
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KEY PLAN

KEY
- 🟢 **A CATEGORY TREE, GROUP, HEDGE, OR WOODLAND** *(HIGH QUALITY & VALUE)*
- 🔵 **B CATEGORY TREE, GROUP, HEDGE, OR WOODLAND** *(MODERATE QUALITY & VALUE)*
- ⚪ **C CATEGORY TREE, GROUP, HEDGE, OR WOODLAND** *(LOW QUALITY & VALUE)*
- 🔴 **U CATEGORY TREE, GROUP, HEDGE, OR WOODLAND** *(UNSUITABLE FOR RETENTION)*
- RPA **ROOT PROTECTION AREAS (RPA)** *(AS DEFINED BY BS 5837:2012)*
- ▨ **APPROXIMATE SHADING ARC** *(AS DEFINED BY BS 5837:2012)*

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P01	04.03.22	FIRST ISSUE

DRAWING STATUS
FOR INFORMATION

PROJECT NUMBER
60665962

SHEET TITLE
TREE CONSTRAINTS PLAN
(SHEET 01)

SHEET NUMBER **REV.**
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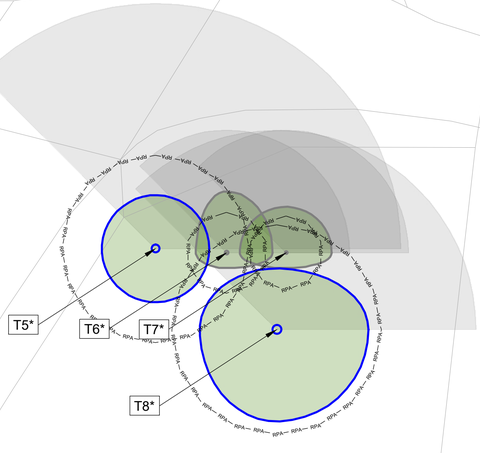

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KEY PLAN

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TREE CONSTRAINTS PLAN
(SHEET 02)

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GENERAL NOTES

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TREE CONSTRAINTS PLAN (SHEET 03)

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ANNEX B TREE SURVEY SCHEDULE

Tree ID	Species	Est Height (m)	Stem Diameter(mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Tree Work Recommendations	Works to Facilitate Proposed Development	Estimated Remaining Contribution	Category
G1*	Pin Oak (*Quercus palustris*), Pine (*Pinus sp*), Aspen (*Populus tremula*)	18	300	3	3	3	3	n/a	n/a	Good	SM	Good	A small group of closely packed trees. Easily replaced but have good future potential. Mound of soil at bases. No access to trees, surveyed from distance.		Fell	10+	C1,2
G2*	Cherry (*Prunus sp*), Field Maple (*Acer campestre*)	15	280	3	3	3	3	n/a	n/a	Good	SM	Good	A small line of trees with good forms. Good screening value. Northern cherry has minor wound at base. No access to trees, surveyed from a distance. Northern cherry is dominant tree in group.		Fell.	10+	C2
T3*	Common Oak (*Quercus robur*)	16	710	7	7	7	7	7.0/NE	8	Good	EM	Good	Growing immediately adjacent to boundary fence. High crown clearance. Minor deadwood within crown. Overall good form. Barbed wire around stem at circa 2.5m.		Fell.	20+	B1,2
G4*	Ash (*Fraxinus excelsior*), Common Oak (*Quercus robur*), Pin Oak (*Quercus palustris*), Cherry (*Prunus sp*)	8	280	3	3	3	3	n/a	n/a	Good - Dead	Y-SM	Good - Dead	Multiple standing dead stems in group with decay fungi present. Trees all previously topped at circa 8m. Very poor forms and poor future potential. Fair screening value. No access to trees.		Fell.	10+	C2,3
T5*	Scots Pine (*Pinus sylvestris*)	16	510	3.5	3.5	3.5	3.5	6.0/NW	5	Good	SM	Good	Previous pruning in lower crown leaving many dead branch stubs. Overall good form and good future potential.			20+	B1,2
T6*	Norway Maple (*Acer platanoides*)	8	220	4	1	3	2	4.0/S	4	Good	SM	Good	Minor northern stem lean. Overshadowed by larger adjacent pine.			10+	C1
T7*	Ash (*Fraxinus excelsior*)	8	200	3	1	3	3	4.0/N	4	Good	SM	Good	Minor northern stem lean. Minor tree with good future potential. Suppressed by adjacent tree to south.			10+	C1

Tree ID	Species	Est Height (m)	Stem Diameter(mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Tree Work Recommendations	Works to Facilitate Proposed Development	Estimated Remaining Contribution	Category
T8*	Norway Maple (*Acer platanoides*)	13	570	4	6	6	5	3.0/SE	3	Good	EM	Fair	Dominant tree in group. Previously lost northern leading stem, losing significant amount of crown. Minor regrowth at point of failure.			20+	B1
W9*	Ash (*Fraxinus excelsior*), Willow (*Salix sp*), Hawthorn (*Crataegus monogyna*), Hazel (*Corylus avellana*), Turkish Hazel (*Corylus colurna*)	16	<1050	7	7	7	7	n/a	n/a	Good - Fair	Y-M	Good - Fair	A small woodland group. Large willow on northern edge of group is largest tree. Deadwood within group. Good mix of broadleaf species. Young hawthorn scrub in understory.		Fell in part as shown on the TPP.	20+	B1,2
T10*	Ash (*Fraxinus excelsior*)	8	320	3	4	4	1	3.0/E	3	Good	SM	Fair	Western crown suppressed and tree presents an eastern stem lean. Minor included union at circa 2m. No natural bracing.		Fell.	10+	C1
G11*	Hawthorn (*Crataegus monogyna*)	6	200	2.5	2.5	2.5	2.5	n/a	n/a	Good	SM	Good	A compact group of hawthorn. Minor deadwood.		Fell.	10+	C2
G12*	Lawson Cypress (*Chamaecyparis lawsoniana*)	6	220	3	3	3	3	n/a	n/a	Good	SM	Fair	Previously topped in center of group. Provides screening value.		Fell.	10+	C2
T13*	Ash (*Fraxinus excelsior*)	9	600	2	2	2	2	5.0/N	6	Fair	EM	Poor	Tree previously topped and limbs largely reduced. Previous pruning on stem. Tree presents very poor form and has limited future potential.		Fell.	10+	C2
T14*	Ash (*Fraxinus excelsior*)	9	650	2	1	3	3	7.0/NW	6	Fair	EM	Poor	Tree previously topped and limbs largely reduced. Previous pruning on stem. Tree presents very poor form and has limited future potential.		Fell.	10+	C2

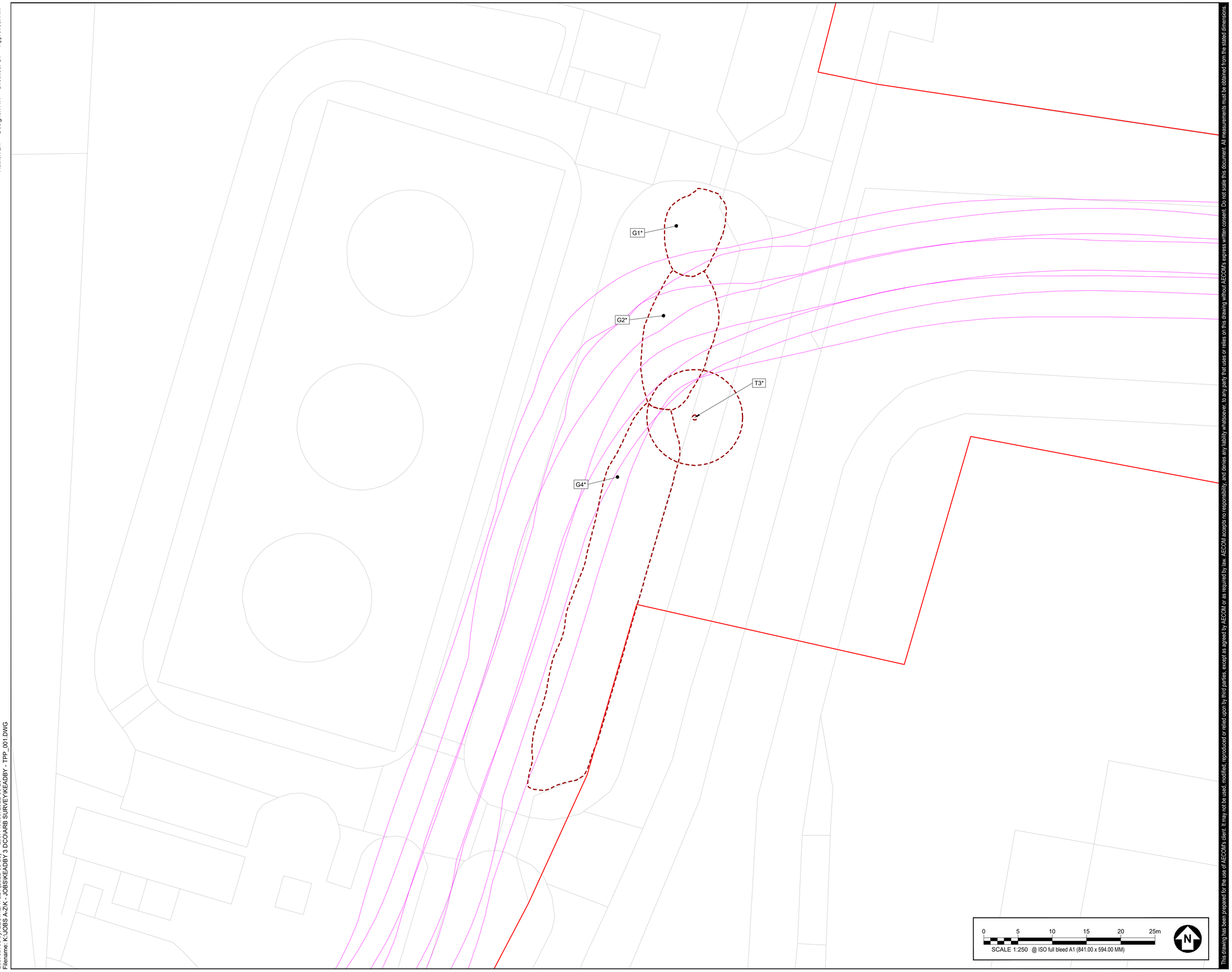
Tree ID	Species	Est Height (m)	Stem Diameter(mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Tree Work Recommendations	Works to Facilitate Proposed Development	Estimated Remaining Contribution	Category
T15*	Willow (*Salix sp*)	10	1100	6	6	4	4	1.0/S	2	Fair	M	Poor	Large open wound at base of stem with decay of exposed heartwood. Large limbs previously removed and tree previously topped. Vigorous regrowth at topping points. Large, included union on primary southern limb. Poor future potential.	Fell (<3 months)		<10	U1
T16*	Willow (*Salix sp*)	10	910	5	2	5	5	4.0/E	2	Fair	M	Fair	Previous large limbs removed on stem leaving decaying flush cuts. Tree previously topped at circa 8m. Decay fungus on open wound to north. Poor future potential.			10+	C2
G17*	Common Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*), Field Maple (*Acer campestre*), Wild Privet (*Ligustrum vulgare*)	10	210	3	3	3	3	n/a	n/a	Good	SM	Good	A small, clustered group of trees. Good landscape value and future potential. Some previous pruning in lower crowns. Minor included cup union on one alder, but no major visible defects.		Fell in part as shown on the TPP.	10+	C2
T18*	London plane (*Platanus x acerifolia*)	11	780	4	3	3.5	3	3.0/SW	2.5	Good	M	Fair	Previously topped at circa 10m. Poor pruning cuts around crown with vigorous growth at points of pruning.			20+	B2
T19*	London plane (*Platanus x acerifolia*)	11	750	5	4	4.5	2	3.0/NE	3	Good	M	Fair	Previously topped at circa 10m. Poor pruning cuts around crown. Vigorous growth at points of pruning. Western crown suppressed by adjacent tree.			20+	B2

Key to Abbreviations Used in the Survey

Ref No	Specific identification number given to each tree or group. T=Tree/H=Hedgerow/G=Group/W-Woodland.	
Species	Common name followed by botanical name shown in *italics*	
RPA	Root Protection Area (As defined by BS5837)	
Stem diameter	Diameter of main stem, measured in millimetres at 1.5 m above ground level. (MS = Multi-stem tree measured in accordance with BS5837 Annexe C)	Av / Average: indicates an average representative measured dimension for the group or feature
Spread	The width and breadth of the crown. Estimated on the four compass points in metres.	
Crown clearance	The estimated height (in metres) above ground level of the lowest significant branch attachments.	
#	Estimated dimensions	
*	Indicates estimated position of tree (not indicated on topographical survey).	
Category	Categorisation of the quality and benefits of trees on Site as per Table 1 and 2 of BS5837:2012. 1=Arboricultural quality/value 2=Landscape quality/value 3=Cultural quality/value (including conservation)	
	A=High quality/value 40yrs+ (light green). B=Moderate quality/value 20yrs+ (mid blue) C=Low quality/value min 10yrs/stem diameter less than 150mm (grey). U=Unsuitable for retention (dark red).	
Life stage	**Young (Y):** Newly planted tree 0-10 years. **Semi-Mature (SM):** Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size). **Early Mature (EM):** Tree in the second third of its normal life expectancy for the species (some potential for future growth in size) **Mature (M):** Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size).	

	Over Mature (OM): Tree beyond the normal life expectancy for the species. **Veteran (V):** Tree which is of interest biologically, aesthetically or culturally because of its condition, size or age.
Structural condition	**Good:** No significant structural defects **Fair:** Structural defects which can be resolved via remedial works. **Poor:** Structural defects which cannot be resolved via remedial works. **Dead:** Dead.
Physiological condition	**Good:** Normal vitality including leaf size, bud growth, density of crown and wound wood development. **Fair:** Lower than normal vitality, reduced bud development, reduced crown density, reduced response to wounds. **Poor:** Low vitality, low development and distribution of buds, discoloured leaves, low crown density, little extension growth for the species. **Dead:** Dead **Fair/Good** = Indicates an intermediate condition **Fair – Good** = Indicates a range of conditions (e.g. within a group)
Preliminary management recommendations	Works identified during the tree survey as part of sound arboricultural management, based on the current context of the Site (where relevant reference has been made to tree management based on the potential future context of the site).
Works to facilitate the development	Tree works identified as necessary to facilitate the Proposed Development following a desk top analysis of the proposals in relation to tree constraints.

ANNEX C TREE PROTECTION PLAN



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PROJECT

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CONSULTANT

AECOM
Mid Point, Alencon Link,
Basingstoke, Hants,
RG21 7PP
[redacted]

GENERAL NOTES

1. TREE CATEGORIES AS DEFINED BY BS 5837:2012
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3. * INDICATES A TREE / GROUP WHOSE POSITION IS APPROXIMATE AS BASED UPON AERIAL PHOTOGRAPHY AND ON SITE OBSERVATIONS.
4. PLANS SHOULD BE READ IN CONJUNCTION WITH THE AECOM ARBORICULTURAL REPORT.
5. THE ORIGINAL OF THIS DRAWING WAS PRODUCED IN COLOUR - A MONOCHROME COPY SHOULD NOT BE RELIED UPON.
6. DRAWING REFERENCES:
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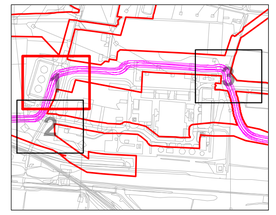
   ES_Addendum_Red_Line_20220315.dwg

KEY PLAN



KEY

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- EXISTING TREE, GROUP, WOODLAND, OR HEDGE TO BE RETAINED
- EXISTING TREE, GROUP, WOODLAND, OR HEDGE TO BE REMOVED
- ROOT PROTECTION AREA OF RETAINED TREES *(AS DEFINED BY BS 5837:2012)*
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- CONSTRUCTION EXCLUSION ZONE *(TRACKING OF PLANT, MATERIALS STORAGE, EXCAVATION AND ALL OTHER CONSTRUCTION ACTIVITIES ARE EXCLUDED WITHIN THESE AREAS FOR THE PURPOSES OF PROTECTING TREE HEALTH)*
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- PROPOSED DEVELOPMENT LAYOUT *(BASED UPON DRAWING REFERENCES LISTED IN THE GENERAL NOTES SECTION)*
- TPF — SET BACK TREE PROTECTION FENCE LINE *(WITH APPROVAL FROM SITE ARBORICULTURIST)*

ISSUE/REVISION

P01	28.03.22	FIRST DRAFT
I/R	DATE	DESCRIPTION

DRAWING STATUS

FOR INFORMATION

PROJECT NUMBER

60665962

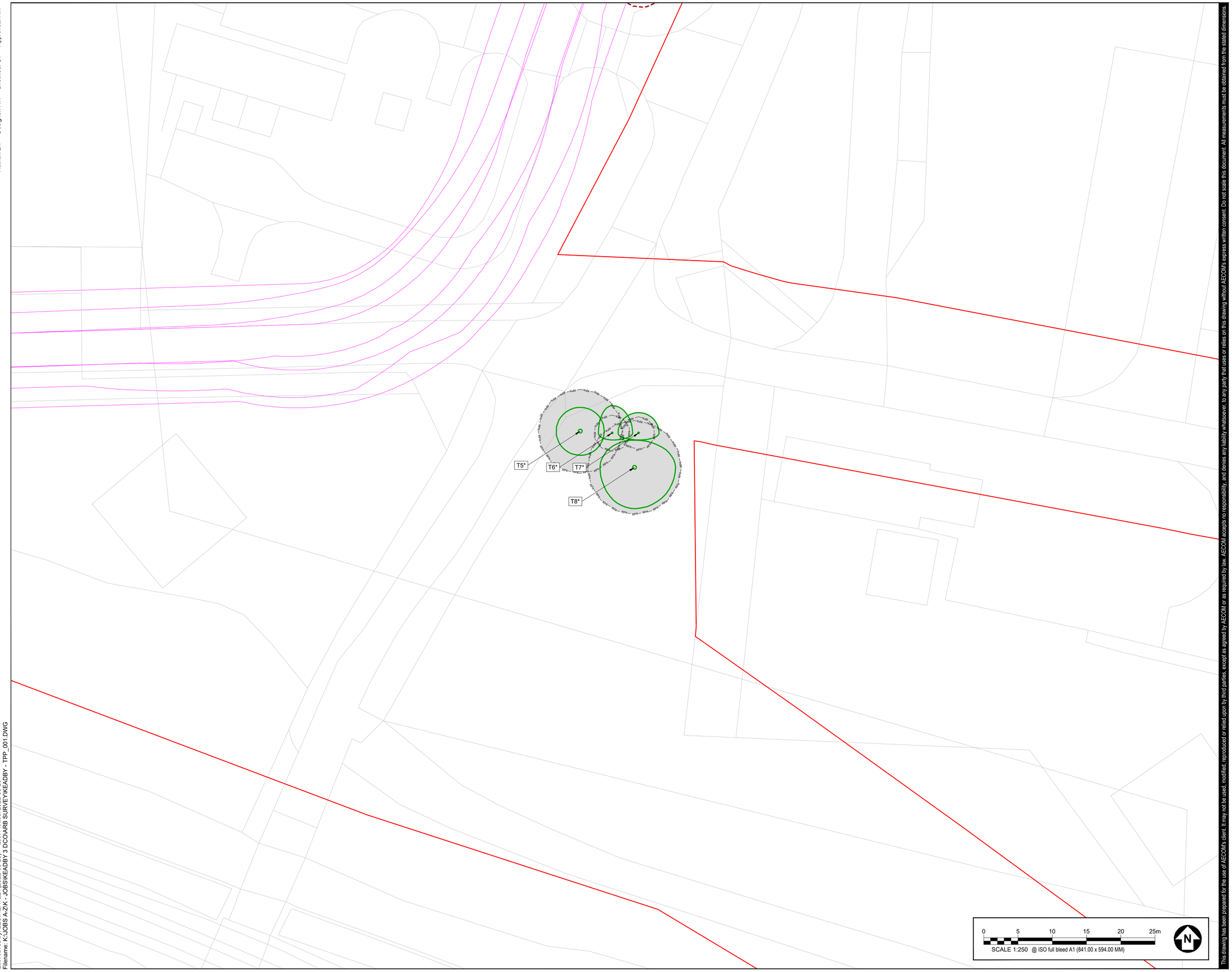
SHEET TITLE

TREE PROTECTION PLAN (SHEET 01)

SHEET NUMBER **REV.**

60665962-ACM-XX-XX-AB-TPP-001 P01

Author: LH Designer: AW Checked: GT Approved: AW



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PROJECT

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Mid Point, Alencon Link,
Basingstoke, Hants,
RG21 7PP
Tel [redacted]

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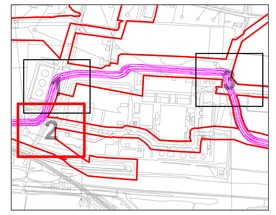
KEY PLAN



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ISSUE/REVISION

I/R	DATE	DESCRIPTION
P01	28.03.22	FIRST DRAFT

DRAWING STATUS

FOR INFORMATION

PROJECT NUMBER

60665962

SHEET TITLE

TREE PROTECTION PLAN
(SHEET 02)

SHEET NUMBER 60665962-ACM-XX-XX-AB-TPP-002

REV. P01

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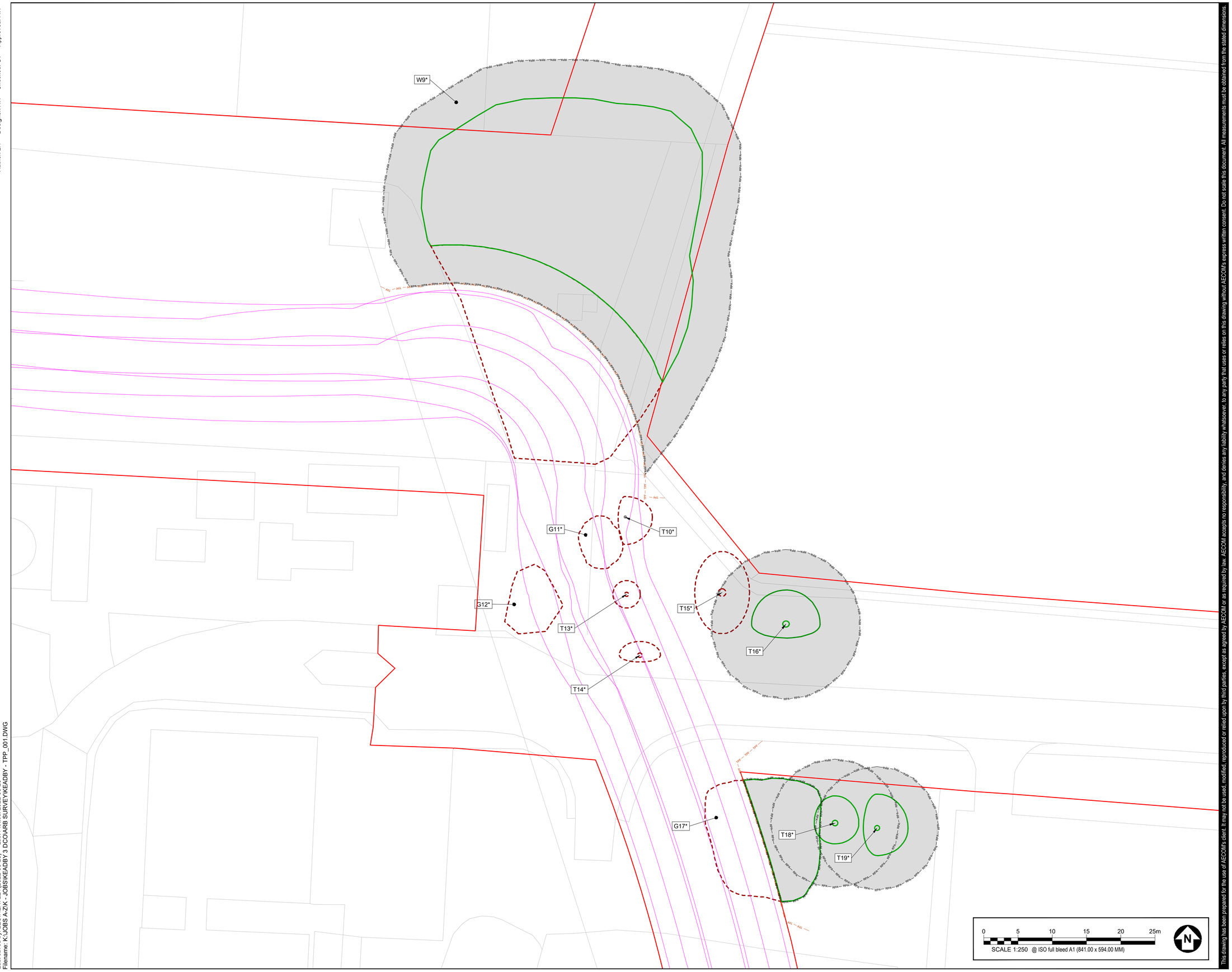
Author: LH Designer: AW Checked: GT Approved: AW



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Mid Point, Alencon Link,
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RG21 7PP
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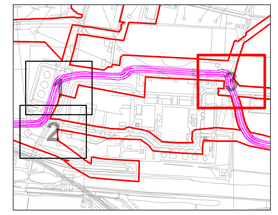
KEY PLAN



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ISSUE/REVISION

I/R	DATE	DESCRIPTION
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DRAWING STATUS

FOR INFORMATION

PROJECT NUMBER

60665962

SHEET TITLE

TREE PROTECTION PLAN
(SHEET 03)

SHEET NUMBER 60665962-ACM-XX-XX-AB-TPP-003

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ANNEX D OUTLINE TREE PROTECTION MEASURES

Outline Tree Protection Measures

The default position as set out by BS 5837:2012 is that retained trees must be protected from construction operations with the erection of robust protective fencing positioned on the outer edge of the RPA or crown spread (whichever is greatest). All site operations will be restricted to the area outside of tree protection fencing and this area will form a Construction Exclusion Zone (CEZ) unless agreed otherwise. Protection measures will be installed as set out in the Tree Protection Plan included as Annex C of this report.

The area inside the fence and any additional tree protection measures will be sacrosanct and must not be removed or altered without the prior approval of the North Lincolnshire Council Tree Officer. Any damage to tree protection measures must be reported immediately.

Fencing shall be constructed with robust vertical and horizontal scaffold framework with weldmesh panels firmly attached as per BS 5837:2012 Figure 7 (included below). Vertical support poles and bracing poles must be located with care to avoid underground utility services and will be sited to avoid the structural roots of retained trees.

Alternative equivalent robust and immovable fencing specification including site hoarding will also be appropriate.

Suitable all weather signage will be fixed to fencing to notify site staff and visitors of the construction exclusion zone and its purpose (example included as Annex E).

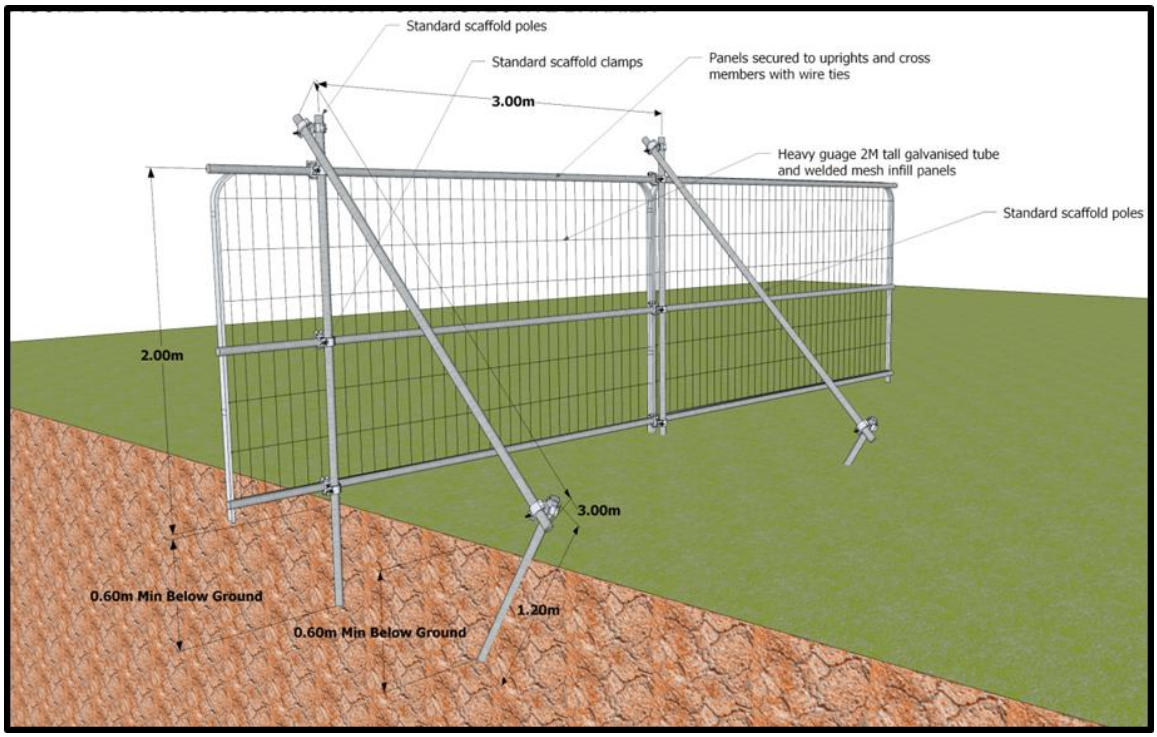


Figure 2: Default specification for protective barrier

Protective fencing and ground protection shall stay in place until all development operations have been completed and the prior consent of the North Lincolnshire Council Tree Officer and/or an arboriculturist has been obtained.

Ground Protection

Should access be unavoidable within the RPA of a retained tree, fit for purpose ground protection must be in place which is sufficient to protect the structure of the soil from damage based on the heaviest anticipated load.

As set out in section 6.2.3.3 of BS5837:2012 the following ground protection measures will be appropriate:

- Suitable ground protection for pedestrian only access will comprise a single thickness of scaffold boards set on a compressible layer of 100mm of woodchip on a geotextile separation layer.
- Pedestrian operated plant up to two tonnes in weight would require the use of a proprietary ground protection system (such as Ground Guards or Eve Trakway or equivalent) set on a minimum depth of 150mm woodchip or sharp sand.
- Heavier loads will require ground protection to an engineering specification in conjunction with arboricultural advice.

As a guide the threshold beyond which root development is significantly affected is a bulk density ranging from 1.4g per cm^3 for clay soils, to 1.75g per cm^3 for sandy soils.

Tree protective measures shall stay in place until all construction operations are completed and removal is agreed with the Site Arboriculturist and/or the North Lincolnshire Council Tree Officer as appropriate.

General guidance for the management of exposed roots

Excavation must only take place within the RPA of a retained tree with the prior agreement of an arboriculturist and the North Lincolnshire Council Tree Officer. All excavation must be undertaken using hand tools or compressed air (such as an air spade).

The following general principles will apply:

- Individual or small groups of roots less than 25mm in diameter will be retained where possible but can be severed with a sharp tool such as secateurs or pruning saws to leave a clean cut end (ideally 100mm back from the face of the excavation to account for future regrowth) where they pose an obstruction.
- Where roots are encountered which are larger than 25mm in diameter or where significant groups of smaller roots are found, the advice of an arboriculturist must be sought to decide an appropriate course of action (following consultation with the North Lincolnshire Council Tree Officer where appropriate).
- Roots must only be exposed for the minimum period possible. In the interim period any exposed roots must be completely covered with dampened hessian sacking

(which may require ongoing re wetting) to avoid drying out and exposure to light (which can result in the death of roots). Backfill for excavations should utilise the parent material and must not be significantly compacted.

Storage, use and mixing of materials

The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction sites can be toxic to tree roots (such as concrete, fuels, salts, builders sand and herbicides), can result in the death of tree roots and beneficial soil organisms; and have a significant impact on the future health and appearance of trees.

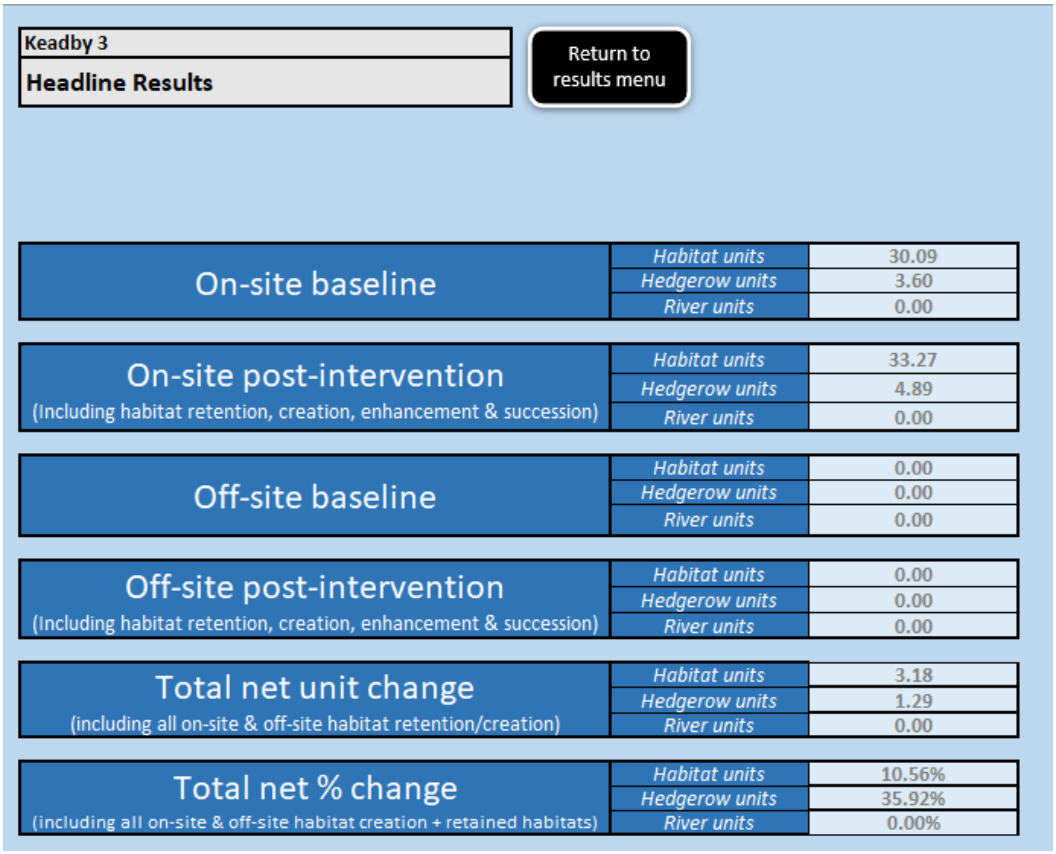
The storage of materials can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree.

For these reasons the storage of materials and any washing, mixing or refuelling must take place in agreed allocated areas at least 10m from the edge of the RPA of retained trees.

Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.

ANNEX E TREE PROTECTION SIGNAGE (EXAMPLE)

~~APPENDIX E OUTPUT FROM HABITAT LOSS/ GAIN CALCULATOR~~



Keadby 3

Headline Results

Return to results menu

On-site baseline	*Habitat units*	30.09
	Hedgerow units	3.60
	River units	0.00
On-site post-intervention (Including habitat retention, creation, enhancement & succession)	*Habitat units*	33.27
	Hedgerow units	4.89
	River units	0.00
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation, enhancement & succession)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention/creation)	*Habitat units*	3.18
	Hedgerow units	1.29
	River units	0.00
Total net % change (including all on-site & off-site habitat creation + retained habitats)	*Habitat units*	10.56%
	Hedgerow units	35.92%
	River units	0.00%

Keadby 3
A-1 Site Habitat Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Ref	Habitats and areas: Broad Habitat	Habitats and areas: Habitat type	Habitats and areas: Area (hectares)	Habitat distinctive: Distinctiveness	Habitat conditio: Condition	Ecological: Ecological connectiv	Strategic significance: Strategic significance	Suggested action to address habitat losses	Ecological: Total habitat units	Retention categor biodiversity value: Area retained	Area enhanced	Area succession	Baselin e units retaine	Baseli ne units	Baseline units successi	Are
2	Grassland	Grassland - Modified grassland	1.13	Low	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	3.39				0.00	0.00	0.00	
3	Lakes	Lakes - Ditches	0.04	Medium	Poor	Low	Area/compensation not in local strategy/ no local	Same broad habitat or a higher distinctiveness	0.16				0.00	0.00	0.00	0
4	Urban	Urban - Artificial unvegetated, unsealed surface	4.58	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local	Compensation Not Required	0.00				0.00	0.00	0.00	4
5	Heathland and shrub	Heathland and shrub - Mixed scrub	0.08	Medium	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.48				0.00	0.00	0.00	0
6	Urban	Urban - Open Mosaic Habitats on Previously Developed Land	0.25	High	Moderate	Low	Area/compensation not in local strategy/ no local strategy	Same habitat required	3.00				0.00	0.00	0.00	0
7	Grassland	Grassland - Modified grassland	0.24	Low	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.72				0.00	0.00	0.00	0
8	Heathland and shrub	Heathland and shrub - Hawthorn scrub	0.01	Medium	Poor	Low	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.04				0.00	0.00	0.00	0
9	Grassland	Grassland - Modified grassland	0.3	Low	Poor	Low	Area/compensation not in local strategy/ no local	Same distinctiveness or better habitat required	0.60				0.00	0.00	0.00	0
10	Lakes	Lakes - Ditches	0.08	Medium	Poor	Low	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.32		0.08		0.00	0.32	0.00	0
11	Urban	Urban - Developed land; sealed surface	0.5	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local	Compensation Not Required	0.00		0.5		0.00	0.00	0.00	0
12	Grassland	Grassland - Modified grassland	1.2	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	2.40		1.2		0.00	2.40	0.00	0
13	Grassland	Grassland - Modified grassland	0.5	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.00		0.5		0.00	1.00	0.00	0
14																
15																
16																
17																
18																
		Total site area ha	17.90					Total Site baseline	30.09	0.00	2.28	0.00	0.00	3.72	0.00	15

Keadby 3
A-2 Site Habitat Creation

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Post development/ post intervention habitats: Proposed habitat	Area (hectares)	Distinctiveness	Condition	Ecological: Ecological connectivity	Strategic significance: Strategic significance	Temporal multiplier: Time to target condition/years	Difficulty: Difficulty of creation category	Ha
Grassland - Other neutral grassland	3	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	10	Low	
Urban - Developed land; sealed surface	11.84	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local strategy	0	Low	
Urban - Sustainable urban drainage feature	0.37	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1	Medium	
Grassland - Modified grassland	0.02	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1	Low	
Grassland - Other neutral grassland	0.09	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	10	Low	
Grassland - Other neutral grassland	0.2	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	10	Low	
Heathland and shrub - Mixed scrub	0.1	Medium	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	2	Low	
Totals	15.62							

Keadby 3

A-3 Site Habitat Enhancement

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Baseline habitats	Post development/ post intervention habitats							
		Change in distinctiveness and condition						Ecological connectivit	Strategic significance
Baseline ref	Baseline habitat	Proposed habitat (Pre-populated but can be overridden)	Distinctiveness change	Condition change	Area (hectares)	Distinctiveness	Condition	Ecological connectivity score	Strategic significance
10	Lakes - Ditches	Lakes - Ditches	Medium - Medium	Poor - Fairly Poor	0.08	Medium	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy
11	Urban - Developed land; sealed surface	Grassland - Other neutral grassland	V.Low - Medium	Lower Distinctiveness Habitat - Moderate	0.5	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy
12	Grassland - Modified grassland	Grassland - Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Moderate	1.2	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy
13	Grassland - Modified grassland	Grassland - Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Moderate	0.5	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy
				Total site area	2.28				