KEADBY 3
CARBON CAPTURE POWER STATION

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

Document Ref: 10.2

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

ES Addendum Non-Technical Summary for Consultation

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure Regulations 2009 - Regulation 5(2)(a) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Applicant: Keadby Generation Limited

Date: February 2022

DOCUMENT HISTORY

Document Ref	10.2 Environmental Statement Addendum Non-Technical Summary for Consultation
Revision	VP1.1
Document Owner	AECOM

GLOSSARY

Abbreviation	Description
AGL	Above Ground Level
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.
AOD	Above Ordnance Datum - a spot height (an exact point on a map) with an elevation recorded beside it that represents its height above a given datum.
CCGT	Combined Cycle Gas Turbine - a highly efficient form of energy generation technology. A gas turbine burns gas to drive a turbine to generate electricity. Surplus heat from the turbine is used to generate steam that is used to generate further electricity.
CCP	Carbon Capture Plant – plant used to capture carbon dioxide (CO_2) emissions produced from the use of fossil fuels in electricity generation and industrial processes.
CCUS	Carbon Capture, Usage and Storage – a group of technologies designed to reduce the amount of carbon dioxide (CO_2) released into the atmosphere from coal and gas power stations as well as heavy industry including cement and steel production. Once captured, the CO_2 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
CO_2	Carbon Dioxide - an inorganic chemical compound with a wide range of commercial uses.
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.

Abbreviation	Description
EIA	Environmental Impact Assessment - a term used for the assessment of environmental consequences (positive or negative) of a plan, policy, programme or project prior to the decision to move forward with the proposed action.
ES	Environmental Statement - a report in which the process and results of an Environment Impact Assessment are documented.
FRA	Flood Risk Assessment - an assessment of the flood risk from all sources of flooding for a development
GHG	Greenhouse Gases - atmospheric gases such as carbon dioxide, methane, chlorofluorocarbons, nitrous oxide, ozone, and water vapour that absorb and emit infrared radiation emitted by the Earth's surface, the atmosphere, and clouds.
HRA	Habitats Regulations Assessment - the assessment of the impacts of implementing a plan or policy on a Natura 2000 site required under the Habitats Directive.
kV	Kilovolt - unit of electrical potential. There are 1,000 volts in a kilovolt.
LBMEP	Landscaping and Biodiversity Management and Enhancement Plan
LPA	Local Planning Authority
MAD	Major Accidents and Disasters - the potentially significant effects of a development.
MW	Megawatt - unit of power.
NEP	Northern Edurance Partnership
NLC	North Lincolnshire Council
NSIP	Nationally Significant Infrastructure Project - defined by the Planning Act 2008 and cover 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); wastewater 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.
NSR	Noise Sensitive Receptor - locations or areas where dwelling units or other fixed, developed sites of frequent human use occur which may be sensitive to noise impacts.
NTS	Non-Technical Summary - a summary of the Environmental Statement written in non-technical language for ease of understanding.
Proposed PCC	Power and Carbon Capture site

Abbreviation	Description
PINS	Planning Inspectorate – executive agency of the Ministry of Housing, Communities and Local Government of the UK Government. It is responsible for determining final outcomes of town planning.
the 2008 Act	An Act of Parliament in the UK intended to speed up the process of approving major new infrastructure projects.
Keadby Power Station Site	The existing Keadby Power Station site, comprising the land owned by the Applicant.
Residual Effect	The predicted consequential change on the environment from the impacts of a development after mitigation.
Rochdale Envelope	An approach to consenting and environmental impact assessment, (EIA) named after a UK planning law case, which allows the promoters of development projects to broadly define their schemes within agreed parameters to retain flexibility of design.
Scoping	The process of identifying the issues to be addressed by the Environmental Impact Assessment process. It is a method of ensuring that an assessment focuses on the important issues and avoids those that are considered to be not significant.
Secondary A: Secondary B:	Secondary A: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers; and Secondary B: predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
SoS	The Secretary of State – the decision maker for DCO applications and head of Government department. In this case, the SoS for the Department for Business, Energy and Industrial Strategy (formerly the Department for Energy and Climate Change).
Stakeholder	An organisation or individual with a particular interest in a development project.
Visual Amenity	The enjoyment or benefit that people (individually or as a group) gain from a particular view that may change as a consequence of a proposed development during its construction, operation or decommissioning.
WFD	Water Framework Directive – European Union directive which commits member states to achieve good qualitative and quantitative status of all water bodies.

Abbreviation	Description
Worst-case assumption (or scenario)	An assumption adopted within an environmental impact assessment which identifies a scenario or parameter that would likely result in the maximum environmental effect (termed the worst-case). This is typically applied where uncertainty exists over the detail of a particular development component or approach to project delivery, for which a basis of assessment is needed.
ZCH	Zero Carbon Humber

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1.0 ON-TECHNICAL SUMMARY

1.1 Introduction

1.1.1 This document presents a Non-Technical Summary ('NTS') of an addendum to the Environmental Statement ('ES') that has been prepared to accompany an application ('the Application') for a Development Consent Order ('DCO') to the Secretary of State ('SoS) (for Business, Energy and Industrial Strategy) under Section 37 of the Planning Act 2008 ('the 2008 Act'), by Keadby Generation Limited ('the Applicant') for a new low carbon power station within Keadby Power Station site, near Scunthorpe, Lincolnshire. A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (an 'NSIP'). If granted by the Secretary of State, the DCO will provide the necessary authorisations and consents for the construction, operation and maintenance of the Proposed Development. In this NTS and throughout the ES addendum, this is referred to as the 'Proposed Development'.

1.1.2 The Application, accompanied by an Environmental Statement [**APP-043** to **APP-159**] and an ES Non-technical Summary [**APP-042**], was submitted on 1 June 2021 and was prepared in accordance with the Infrastructure Planning ('Environmental Impact Assessment') Regulations 2017 ('the EIA Regulations').

1.1.3 During the Pre-Examination period and the early stages of Examination, the Applicant has continued to engage extensively with stakeholders and has continued to develop further design information for the future construction and operation of the Proposed Development.

1.1.4 In particular, since the submission of the DCO application, the Applicant has engaged with two potential design contractors to progress a more detailed design of this 'First of a Kind' Proposed Development and through this ongoing work, the Applicant has identified a limited number of changes ('the Proposed Development Changes') that are sought to be made to the Proposed Development.

1.1.5 The Applicant considers that the Proposed Development Changes to the Application, taken together, are material, in that they are materially different to the scheme on which the original application was made, although do not change the fundamental nature or scale of the Proposed Development. Therefore, the Applicant is notifying the Examining Authority ('ExA') of its intention to formally request a material change to the Application and seeks advice from the ExA on the procedural implications. The Proposed Development Changes are intended to enhance the Application, which remains an application for fundamentally the same Project.

1.2 The Proposed Development

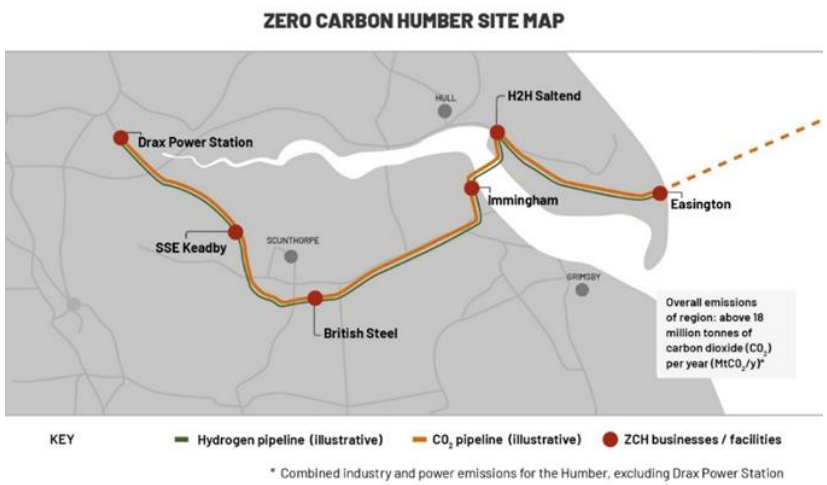
1.2.1 The Proposed Development will be a Combined Cycle Gas Turbine (CCGT) power station like Keadby 1 and Keadby 2 Power Station but will also be fitted with 'First of a Kind' in the UK carbon capture plant (CCP) technology. Depending on how often the plant will run, this will capture up to 2 million tonnes of carbon dioxide (CO_2) emissions per annum, that would otherwise be emitted into the atmosphere. This is equivalent to the annual energy use of over half a million homes in the UK. The Applicant will not build the CCGT without the CCP as the Applicant is committed to building a generating station which has a clear route to decarbonisation. The Proposed Development will therefore make a significant contribution towards the UK reaching its Net Zero greenhouse gas (GHG) emissions target by 2050.

1.2.2 The Proposed Development will work by capturing carbon dioxide emissions from the gas-fired power station and connecting into the Zero Carbon Humber (ZCH) Partnership export pipeline and gathering network for onward transport to the Endurance saline aquifer under the North Sea. 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 Ventures.

1.2.3 All of the land included within the DCO boundary (or 'Order Limits') is referred to as 'the Proposed Development Site' for the purposes of this NTS and is described in Sections 3.0 and 4.0 of this NTS.

1.2.4 This document provides a summary of the ES Addendum which has been prepared to accompany the Application of Material changes to the applied for DCO as if consulting under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) ('the EIA Regulations'). The purpose of this NTS is to describe the changes to the Proposed Development and provide an overview of the key findings of the initial environmental assessment of these changes.

Figure NTS1: Zero Carbon Humber Site Map



1.3 The Applicant

1.3.1 The Applicant remains the same as for the original DCO application , Keadby Generation Limited, who are the freehold owner of a large part of the Proposed Development Site and a wholly owned subsidiary of the FTSE-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 commissioning the Keadby 2 Power Station. SSE also 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.

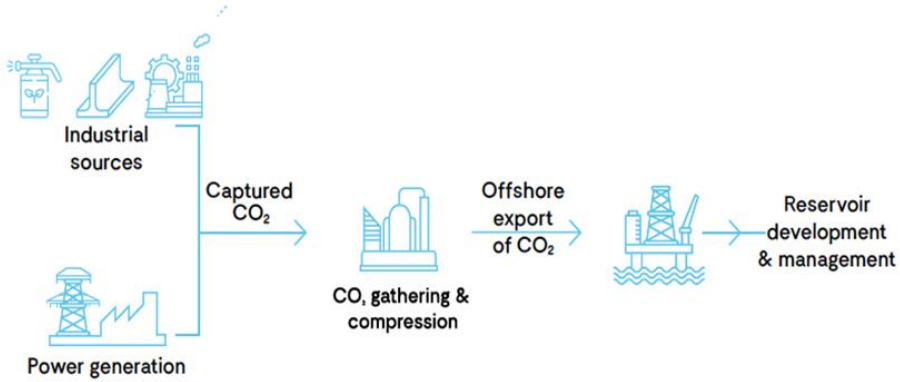
1.3.2 SSE has produced a 'Greenprint' document (SSE, 2020) that sets out a clear commitment to investment in low carbon power infrastructure, working with government and other stakeholders to create a Net Zero power system by 2040. This includes investment in flexible sources of electricity generation 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 National Grid Carbon and Equinor, who SSE are now in a new partnership arrangement with.

1.3.3 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 80% by 2030, compared to 2018 levels.

1.4 What is Carbon Capture, Usage and Storage?

1.4.1 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 storage, typically an underground geological site, preventing it from being released into the atmosphere. CCUS is crucial to reducing carbon dioxide emissions - the UK Government has committed to achieving Net Zero in terms of (GHG) greenhouse gas emissions by 2050. **Figure NTS2** shows what is involved in the process.

Figure NTS2: Illustration of the Carbon Capture, Usage and Storage (CCUS)



1.4.2 Structure of the Original ES

1.4.3 In addition to several chapters describing the Proposed Development, the site and policy, the Original ES Volume I [**APP-043** to **APP-063**] contains the following technical assessment chapters:

- **Chapter 8**: Air Quality;
- **Chapter 9**: Noise and Vibration;
- **Chapter 10**: Traffic and Transport;
- **Chapter 11**: Biodiversity and Nature Conservation;

- **Chapter 12**: Water Environment and Flood Risk;
- **Chapter 13**: Geology, Hydrogeology and Land Contamination;
- **Chapter 14**: Landscape and Visual Amenity;
- **Chapter 15**: Cultural Heritage;
- **Chapter 16**: Socio-economics;
- **Chapter 17**: Climate Change and Sustainability;
- **Chapter 18**: Major Accidents and Disasters; and
- **Chapter 19**: Cumulative and Combined Effects.

1.4.4 A preliminary environmental assessment of whether there would be any new or materially different likely significant effects on the environment arising as a result of Proposed Development Changes has been undertaken, with reference to the previous assessments presented within Volume I and II of the ES [APP-044 to APP-098], as updated by other environmental information accepted by the ExA since acceptance of the Application including:

- **Waste Technical Note;**
- **Updated Flood Risk Assessment (FRA);**
- **Updated Habitats Regulations Assessment (HRA) Appropriate Assessment Report.**

1.5 Environmental Impact Assessment Methodology

1.5.1 The Original ES follows standard EIA methodology, which has also been applied in the ES Addendum.

Rochdale Envelope

1.5.2 Where design details cannot yet be finalised a conservative approach has been adopted whereby the option that gives rise to the worst-case potential environmental impacts and effects, taking into account the updated maximum parameters, has been assessed in the ES Addendum. This is known as the Rochdale Envelope approach and is further explained in Advice Note Nine: Using the Rochdale Envelope (Planning Inspectorate, 2018a).

Classification of effects

1.5.3 The below Matrix demonstrates the methodology applied to determine the significance of effects. In general, the classification of an effect is based on the magnitude (scale) of the impact and sensitivity or value/ importance of the receptor, using the matrix shown in Table 1. Moderate and major effects are considered to be 'significant' for the purposes of the EIA Regulations in accordance with standard EIA practice.

Table 1: Classification of effects

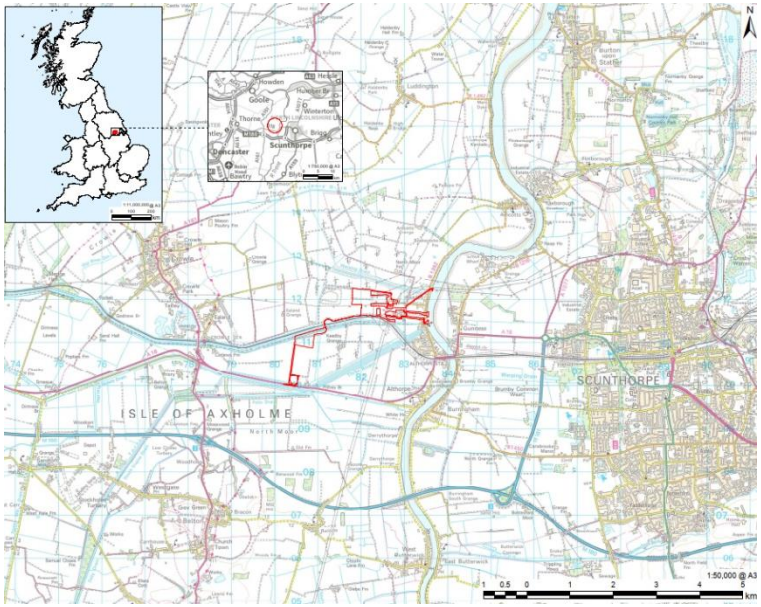
Magnitude of Impact	Sensitivity/Importance of Receptor			
	High	**Medium**	**Low**	**Very Low**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

2.0 DESCRIPTION OF EXISTING ENVIRONMENT

2.1 The Site and Surroundings

2.1.1 The Proposed Development Site is located within and near to the existing Keadby Power Station site near Scunthorpe, Lincolnshire, as shown on **Figure NTS3**, and is centred on national grid reference 482351, 411796.

Figure NTS3: Proposed Development Site Location Plan



2.1.2 The Keadby Power Station site includes the operational Keadby 1 Power Station and Keadby 2 Power Station (under commissioning). It falls within the administrative area of North Lincolnshire Council (NLC).

2.1.3 Beyond the current Keadby Power Station site, land use is predominantly low lying farmland and scattered villages, however, the immediate site surroundings have been developed in recent years with power related infrastructure, including the operational Keadby Windfarm to the north and south of the Proposed Development Site and the pylons associated with the existing National Grid 400kV Substation located within the Proposed Development Site.

2.2 Parts of the Proposed Development Site

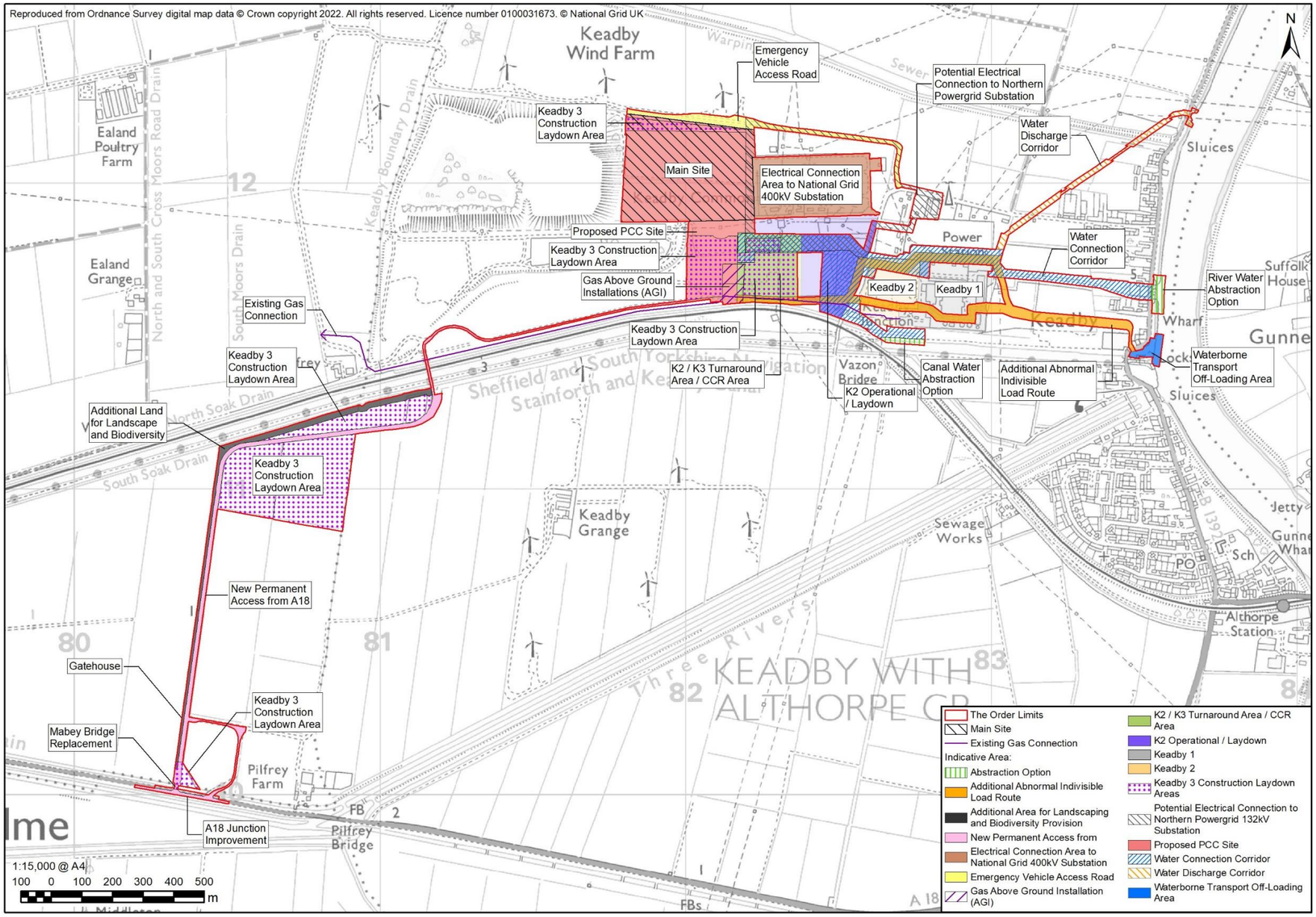
2.2.1 The Proposed Development Site now covers an area of 69.85 hectares (ha) with the proposed design changes resulting in a minor increase of 0.43ha in the amount of the applicants land required.

2.2.2 Many components together make up the Proposed Development Site as shown in **Figure NTS4,** and for the purposes of the ES Addendum, the following names (described in Section 4.0 of this NTS) are used to describe parts of the Proposed Development Site:

- The Proposed Power and Carbon Capture site (Proposed PCC Site) which includes an area referred to as the 'Main Site';
- Electrical Connection Area to National Grid 400 kilovolt (kV) Substation;
- Potential 132kV Electrical Connection from Northern Powergrid Substation;
- Emergency Vehicle Access Road;
- Land within the Keadby Power Station site for the purposes of facilitating connections to the Proposed Development for natural gas supply (Gas Connection Area), and other necessary infrastructure (including 'Water Connection Corridor');
- Water Connection Corridors including River Water Abstraction Option and Canal Water Abstraction Option and Water Discharge Corridor;
- Waterborne Transport Offloading Area;
- Additional Abnormal Indivisible Load (AIL) Route;
- Construction Laydown Areas;
- Construction and Operational Vehicular Site Access Route and Gatehouse;
- A18 Junction Improvement and Mabey Bridge replacement; and
- Additional area for Landscaping and Biodiversity Provision.

2.2.3 The proposed design changes affecting these parts of the proposed project are discussed below at Section 3.2.

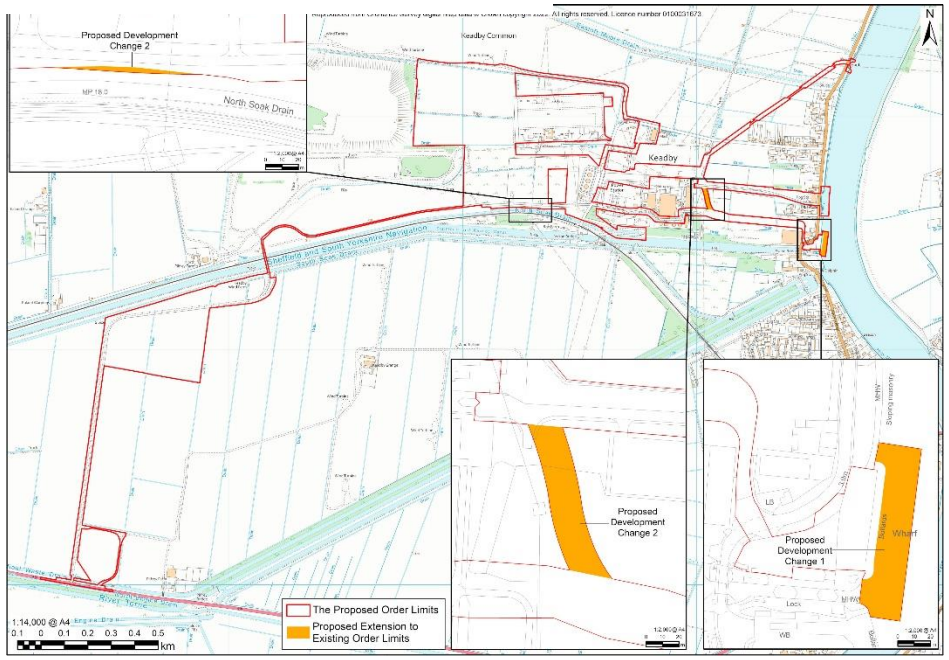
Figure NTS4: Areas of the Proposed Development Site Referred to in the ES Addendum



Existing land use (Proposed Development Changes)

2.2.4 The majority of the Proposed Development Changes are located within the Order Limits submitted with the DCO Application (as shown on APP-101). However, two minor changes to the Order Limits as a result of the Proposed Design changes are required, as shown on Figure NTS5 below.

Figure NTS5: Order Limit Changes



2.2.5 The two Proposed Development Changes that affect the Order Limits are as follows:

- Proposed Development Change 1: addition of a section of river bed to be used by moored vessels in the Waterborne Transport Off-loading Area.
- Proposed Development Change 2: Extension to the Abnormal Indivisble Load (AIL) Route through Keadby 1 Power Station outage/contractor compound, which runs through semi-improved grassland/scrub and hardstanding land occupied by services.

3.0 THE PROPOSED DEVELOPMENT

3.1 Purpose and Components of the Proposed Development

3.1.1 The purpose of the Proposed Development, along with the majority of the construction, operation, maintenance and eventual decommissioning activities relating to the Proposed Development remain unchanged by the Proposed Design changes. All proposed changes are discussed below.

3.2 Proposed Changes to the Proposed Development

Introduction

3.2.1 The Applicant is proposing five changes to the Proposed Development. The Proposed Development Changes set out in this report have resulted from design contractor involvement, which has continued to refine the detail of this 'First of a Kind' Project implementation.

3.2.2 The five Proposed Development Changes are:

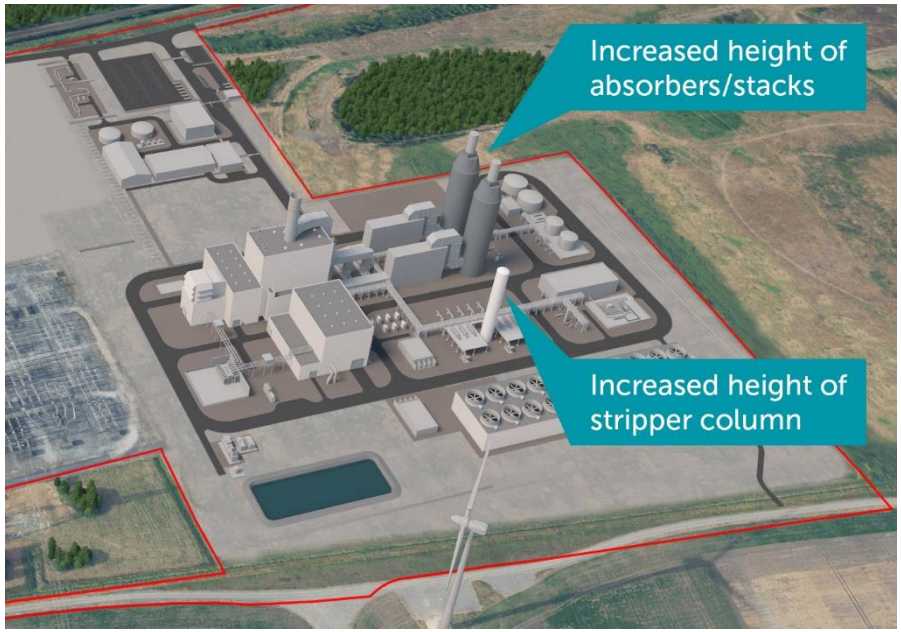
- **Change 1: Inclusion of riverbed within the Waterborne Transport Offloading Area (Railway Wharf) .** An increase in the extent of land included in the Order Limits within the River Trent which would be occupied by delivery vessels is proposed in order to accommodate the largest (82m long) potential vessels, as used during the construction of Keadby 2 Power Station . Where vessels are required to be moored for the full tide cycle, they could require use of the sea bed, which is Crown Land and as such, it is intended to negotiate voluntarily for rights for this (**Work No. 10B**).
- **Change 2: Changes to the Additional Abnormal Indivisible Load Route, largely within SSE land** (**Work No. 10A**). The Applicant proposes an extension to the AIL Route (Work No. 10A) , to avoid reliance on routeing all AILs through Keadby Power Station due to this being an operational site with the potential for health and safety risk management practices to affect the construction timescale and the speed of deployment of this nationally significant infrastructure. This extension utilises land within the Keadby power station site that is currently used as a contractor/ outage compound area, east of Keadby 1 Power Station and north of Keadby 1 Power Station which is all within land under the control of the Applicant. Demolition/ relocation of several small existing Keadby 1 Power Station buildings/ offices within this area may be required. The route would seek to avoid loss of and disturbance to existing vegetation, although where permanent loss of vegetation is unavoidable, compensation/ enhancement of biodiversity including replacement tree planting would be undertaken. Temporary steel bridges will be used to span two drainage ditches (as was the case during the construction of Keadby 2 power station).

- Where the route of the Additional AIL route crosses existing services including Keadby 1 cooling water pipework, a temporary piled steel bridge structure would be used to minimise risk of damage to the pipework and other services. Other parts of the AIL route extension would be constructed using similar materials and techniques to the existing retained AIL Route created for Keadby 2 Power Station construction. Vehicles using the AIL Route extension to deliver AILs would travel west along the northern boundary of Keadby 1 Power Station, within the Order Limits, and then cross Chapel Lane making use of existing site roads adjacent to the existing above ground tank farm to re-join the existing AIL Route along Bonnyhale Road. A very minor increase (0.02ha) to the Order Limits south of Bonnyhale Road is also proposed to allow oversail of the largest AIL components. This area is within the Applicant's land.
- **Change 3: Increase to the maximum heights of the carbon dioxide absorbers/ stacks, if two are installed.** Ongoing engagement with design contractors has identified that in the event that two absorbers are required for the removal of CO_2 from flue gases within the CCP (Work No. 1C), the twin absorber units and stacks may extend to a maximum height of up to 80m above ground level ('AGL') for the absorber towers and an additional up to 15.5m in height for the stacks i.e. up to 95.5m AGL in total, which equates to a maximum of 98.3m Above Ordnance Datum (AOD) for each absorber and associated stack. These maximum dimensions – established through ongoing design development - are approximately 20m higher than those previously assessed for the twin absorber option in the Original ES and presented as a parameter in the draft DCO [APP-005].
- **Change 4: Increase to the maximum heights of the carbon dioxide stripper column.** Ongoing design development with design contractors has identified that the proposed CO_2 stripper column (also Work No. 1C) may have a maximum height of up to 63m AGL, which equates to a maximum of 65.8m AOD which is 10m higher than was included as a parameter in the draft DCO [APP-005].
- **Change 5: Increase in proposed soil import volumes to create a suitable development platform**. Ongoing design development and engagement with design contractors has identified that additional volumes of soil and fill material may need to be imported to provide a suitable platform for foundations and site levels across the Proposed PCC Site, taking into account anticipated ground conditions and the revised finished floor level (revised from 2.6m AOD up to 2.8m AOD based on an updated Flood Risk Assessment). Up to 180,000m^3 of soils may need to be imported, representing an increase of 50,000m^3 over the volume previously stated in the Original ES. However no

material change to the timing of the peak of construction would be required as a result of the soil import increase.

3.2.3 **Figure NTS6** shows the visualisation of the Proposed PCC Site based upon the proposed revised maximum dimensions, twin absorbers and the change to the Proposed Development Site boundary.

Figure NTS6: Visualisation of the Proposed PCC Site based upon maximum dimensions and Twin absorbers



3.2.4 **Figures NTS7 and NTS8** show an indicative layout of the Proposed PCC Site. Figure NTS7 shows the indicative layout of the Proposed PCC Site with a single absorber installed. Figure NTS8 shows the indicative layout of the Proposed PCC Site based on the twin absorber option. The CCGT and CCP including absorber stack(s) would still be located within the defined Work Areas 1A and 1C (Application Document Ref. 4.3) i.e. within the Main Site on the northern part of the Proposed PCC Site.

Figure NTS7: Indicative Proposed PCC Site Layout Single Absorber

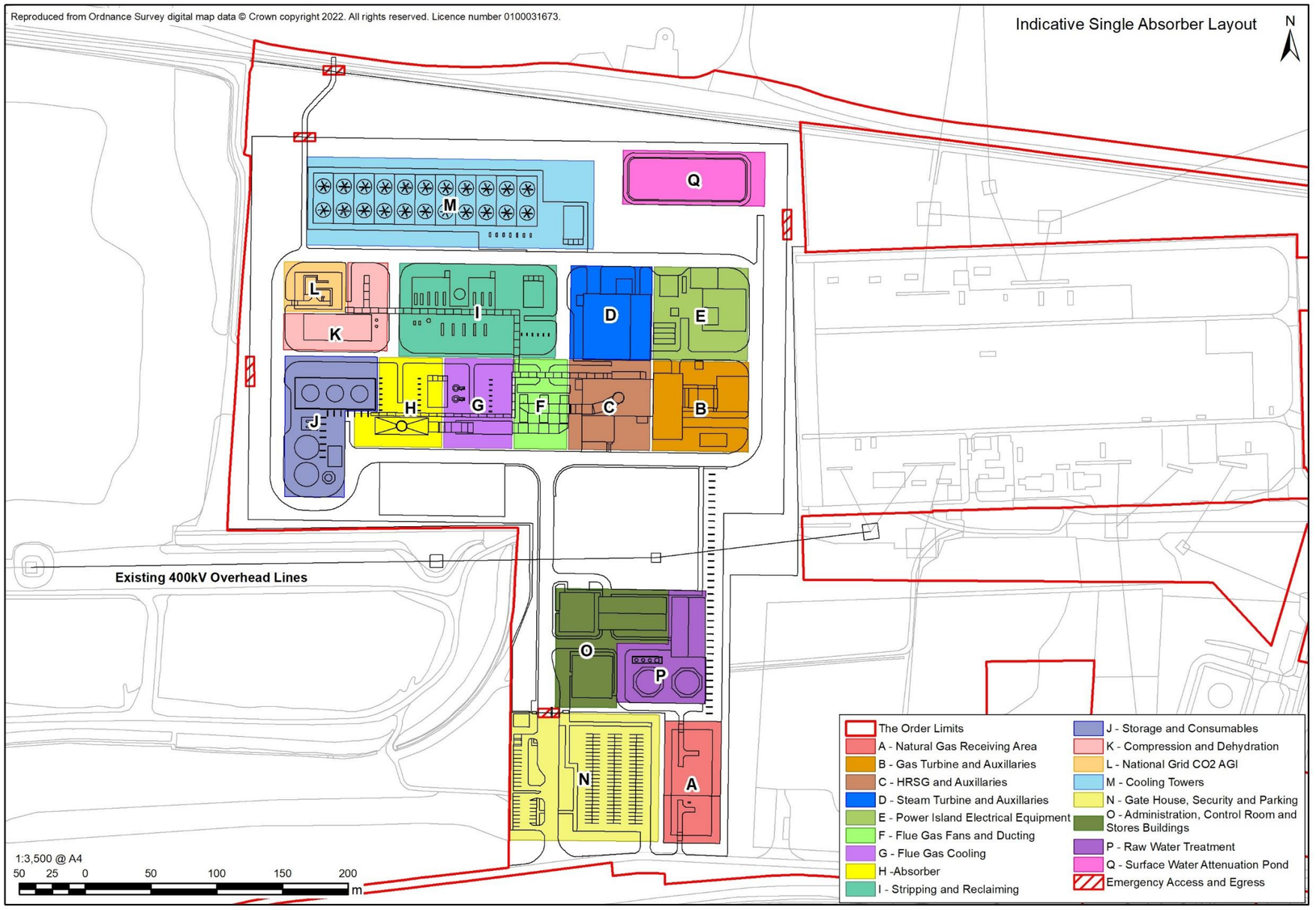
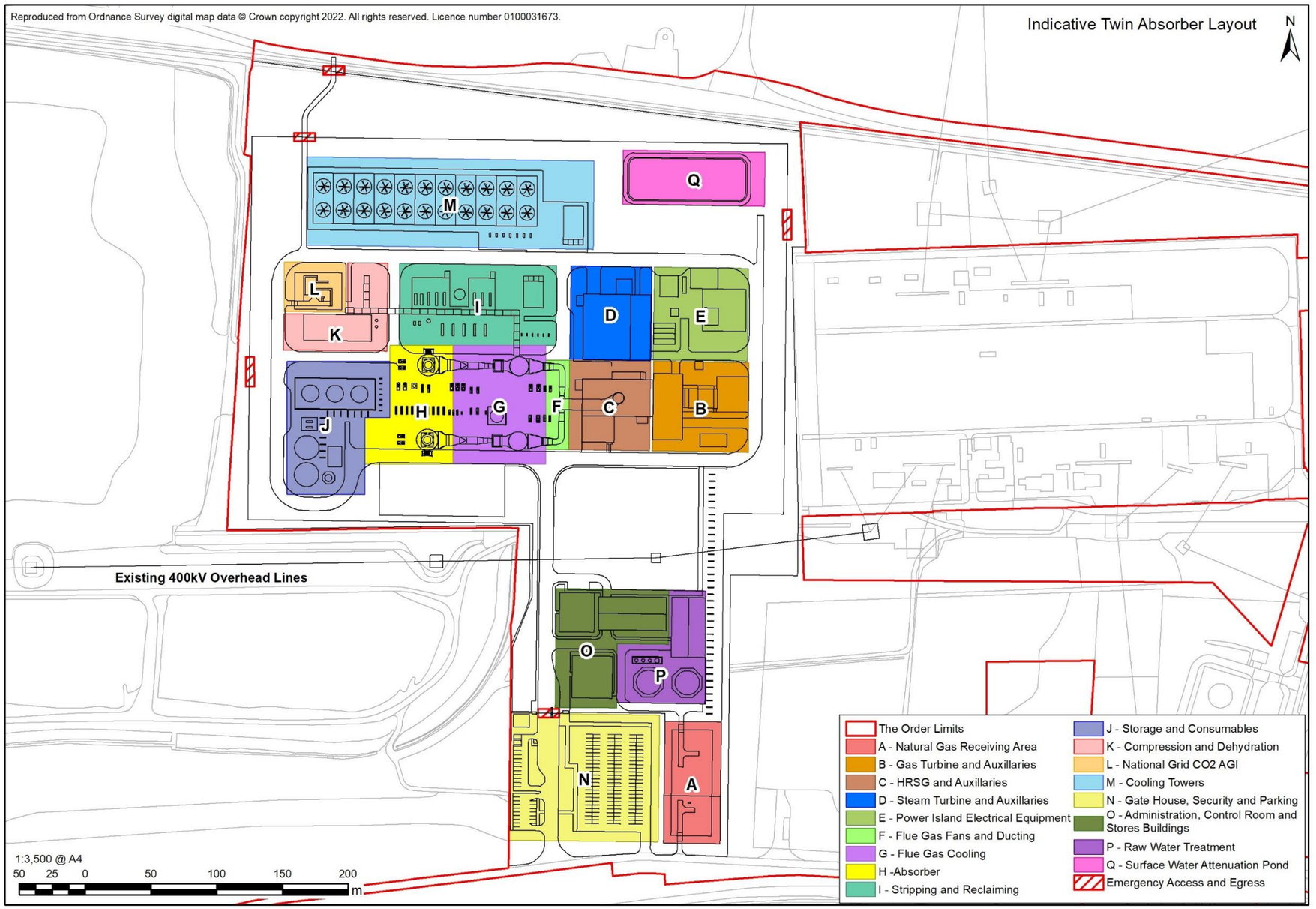


Figure NTS8: Indicative Proposed PCC Site Layout Twin Absorber



3.3 Effects of the Proposed Changes on Construction of the Proposed Development

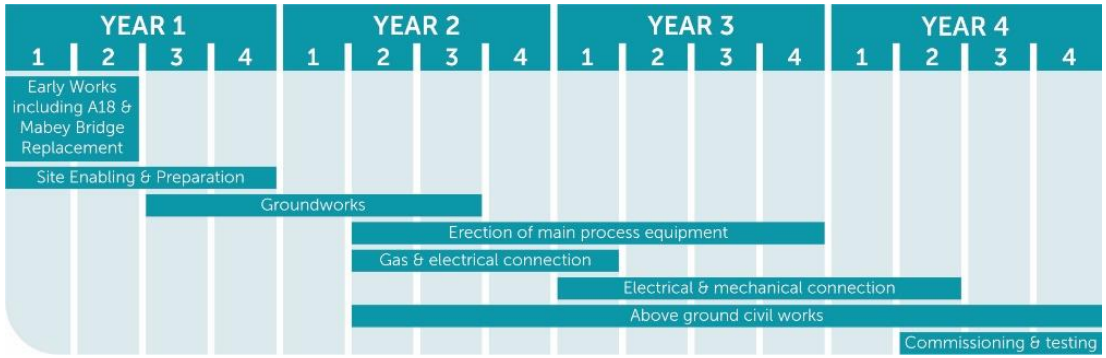
3.3.1 There are no changes to the construction programme as a result of the Proposed Design Changes and construction is still anticipated to potentially commence as early as Quarter 4 2022 which is the earliest that consent could be granted. Construction activities are expected to be completed within three to four years, followed by commissioning; however, detailed phasing will be the responsibility of the appointed construction contractor(s).

3.3.2 Each environmental assessment topic within the Original ES and ES Addendum identifies and assesses the reasonable 'worst-case' construction scenario for that topic, where relevant. The DCO Application seeks consent for commencement of development up to seven years from the date of granting of consent. For this reason, a scenario where construction commences later in the programme - up to 2029 - has also been assumed as a reasonable worst-case for some technical assessments in the ES, such as Traffic and Transport.

3.3.3 The Applicant would appoint contractor(s) to undertake the construction phase of the Proposed Development. The Applicant would retain overall responsibility for the project and would ensure that the works would be undertaken in accordance with legal requirements.

3.3.4 An indicative construction programme is outlined in **Table 2** below.

Table 2: Indicative Construction Programme



3.3.5 The Core construction working hours remain unchanged and are proposed to be 07:00 to 19:00 Monday to Friday (except bank holidays) and 08:00 to 13:00 on Saturdays. However, as outlined in the Original ES, it is likely that some construction activities may need to be undertaken outside of these core working hours, subject to agreement with (NLC) North Lincolnshire Council.

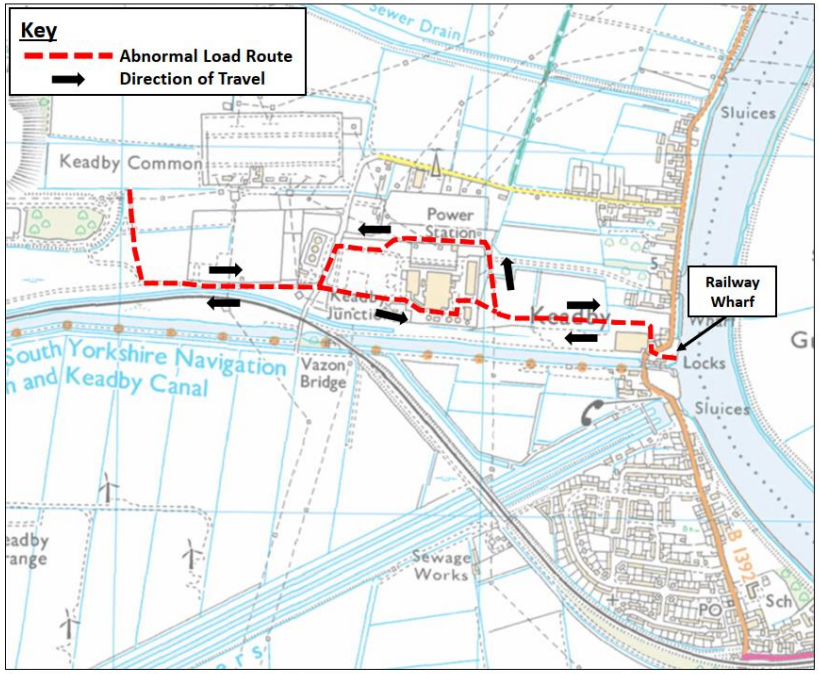
3.3.6 A detailed Construction Environmental Management Plan (CEMP) will be prepared prior to construction. The submission, approval and implementation of this will be secured by a Requirement of the draft DCO (**APP-005**). A Framework CEMP **(APP-160**) has been prepared and is submitted accompanying the DCO Application. The Framework CEMP revised at deadline 3 (**REP3-010**) sets out the key measures to be employed during construction to control and minimise the impacts on the environment.

3.3.7 All enabling and construction works will be undertaken in accordance with the Construction Design and Management Regulations (2015) (CDM Regulations) (HMSO, 2015)

3.3.8 Changes in the construction activities from those assessed in the Original ES as a result of the Proposed Development Changes are described below:

- **Change 1** does not result in any changes to construction activities.
- **Change 2:**
  - The temporary haul road will be constructed using geotextile separation membrane with granular compacted stone laid on top and using a temporary piled steel bridge to span the Keadby 1 cooling pipeline.
  - Temporary steel bridges will be used to span two drainage ditches
  - A very minor increase (0.02ha) to the Order Limits south of Bonnyhale Road is also proposed to allow oversail of the largest AIL components. This area is within the Applicant's land.
  - Following construction of the extension to the AIL Route, enhancement of habitats within the route will be undertaken as part of the overall landscape and biodiversity management and enhancement proposals (**Work No. 11a**).

Figure NTS9: Abnormal Indivisible Load Route from Wharf



- **Changes 3 & 4:** do not result in any changes to construction activities.
- **Change 5:** An increase of up to 50,000m^3 above the previously presented volume of 130,000 m^3 related to the maximum proposed import volumes for soil (described in Chapter 5: Construction Programme and Management [APP-048]) is proposed to provide a suitable platform for foundations and buildings/ equipment across the PCC Site during construction. In part this change is due to the increase in required site levels from 2.6mAOD to 2.8mAOD as identified by the updated Flood Risk Assessment that was submitted into Examination at Deadline 1.

3.4 Effects of the Proposed Changes on Operation of the Proposed Development

There will be no changes to the operation of the Proposed Development as a result of the Proposed Development Changes.

3.5 Effects of the Proposed Changes on Decommissioning of the Proposed Development

There will be no changes to the decommissioning of the Proposed Development as a result of the Proposed Development Changes.

4.0 CONSIDERATION OF ALTERNATIVES TO THE PROPOSED DESIGN CHANGES

4.1 Introduction

4.1.1 The EIA Regulations state that an ES (and therefore an ES Addendum) should include a description of reasonable and relevant alternatives studied by an applicant, taking into account potential environmental effects. **Chapter 6**: Consideration of Alternatives [APP-049] provides this information in the Original ES; in respect of the Proposed Development Changes the alternatives considered are discussed below and will be included in the ES Addendum.

4.2 Alternatives considered

4.2.1 Proposed Development Change 1 (extension of Waterborne Transport Offloading Area to incorporate land within River Trent). Alternatives to making this change would involve reducing the size of the largest boats that could be moored at the wharf, leading to more construction being required on site and potentially more road transport movements, and have therefore not been considered further.

4.2.2 Proposed Development Change 2 (extension to the Additional AIL Route):

- The use of a route solely through Keadby 1 was initially proposed and remains an option to be utilised, however it does introduce additional health and safety risks of routeing abnormal load movements through an operational Power station site.

4.2.3 Proposed Development Change 3 (increase to the maximum parameters (height) for the twin absorbers/ stacks):

- The technology licensor(s) considers that, based on the current level of design information, there is a need to increase the maximum height of the twin absorbers and stacks, recognising that the detailed design may be able to reduce the heights from the maxima presented.
- No alternative consent routes are possible and a change to the DCO Application is required to authorise the extra height.

4.2.4 Proposed Development Change 4 (increase to the maximum parameters for CO_2 stripper column):

- The technology licensor(s) considers that, based on the current level of design information, there is a need to increase the maximum height of the stripper, recognising that the detailed design may be

able to reduce the height from the maximum presented.

- No alternative consent routes are possible and a change to the DCO application is required to authorise the extra height.

4.2.5 Proposed Development Change 5 (increase in proposed soil import volumes):

- No alternatives to this Proposed Development Change have been previously considered. This proposed change allows the higher elevation site platform to be constructed while minimising the risk of ground conditions being unsuitable for the Proposed Development.

5.0 SUMMARY OF POTENTIAL ENVIRONMENTAL EFFECTS OF PROPOSED DEVELOPMENT CHANGES

5.1.1 This section presents a summary of the likely environmental effects predicted to occur as a result of the Proposed Development Changes. The likely significant environmental effects will be fully described in ES Addendum Volume I (and its accompanying technical appendices (ES Volume II) once the documents are published.

5.1.2 A screening exercise has been carried out to decide which environmental assessments and topics should be scoped in and out of the assessment within the ES Addendum, given the nature of the Proposed Development Changes. Assessment of the environmental effects of the Proposed Development Changes for each of the topics that have been scoped for inclusion will be included in the ES Addendum.

Table 3: Keadby 3 Carbon Capture Power Station

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
1-7	Chapters 1 – 7 are non- technical chapters and therefore do not report changes in significance and magnitude
8	There are no changes to the magnitude of significance or introduction of any new significant effects within **Chapter 8:** Air Quality resulting from the Proposed Design changes and the changes would not result in significant effects on air quality receptors. Change 1 – no change Change 2 – no change Change 3 An assessment of emissions resulting from the revised parameters for the twin absorbers option has been undertaken, however there are no new or different significant operational air quality impacts at human health receptors as a result of Proposed Development Change 3. At ecological receptors, the results from the modelling of the two absorber stacks indicate that the concentrations of NOx and NH3 are very slightly higher at the majority of the ecological receptors assessed; due to wider pollutant dispersal, although the overall level of impact remains comparable to those presented with Chapter 8: Air Quality of the Original ES Volume I (Document Ref. 6.2.8) [APP-051]. Change 4 – no change Change 5 – no change

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
9	There are no adverse changes to the significance of effects assessment on noise sensitive receptors (NSR), or introduction of any new significant effects, within Chapter 9: Noise and Vibration. Change 1 – no change Change 2 An assessment of construction noise from installation of the temporary piled bridge structure for crossing existing services has been undertaken based on the comparable bridge installation works required during the construction of Keadby 2 power station. There are no new or different significant effects as a result of Proposed Development change 2. Change 3 Modelling and assessment of operational noise levels resulting from the revised parameters and additional information for the twin absorbers option has been undertaken. However, there are no new or different significant operational noise effects as a result of Proposed Development change 3. Change 4 – no change Change 5 – no change
10	There are no changes to the magnitude of significance or introduction of any new significant effects within **Chapter 10**: Traffic and Transport and **Appendix 10A:** Transport Assessment as a result of the Proposed Design Changes. The proposed increased in soil or fill volume import to Site remains within the Rochdale Envelope assessed in the Original ES and does not change the conclusions presented in that ES chapter.

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
11	There are no changes to the magnitude of significance or introduction of any new significant effects within **Chapter 11:** Biodiversity and Nature Conservation or the HRA Assessment resulting from the Proposed Development Changes. While there would be additional losses of small areas of grassland and plantation woodland habitat of local nature conservation value resulting from the changes to the indicative Order Limits this will not affect the conservation status of these habitats in the wider local landscape and will be appropriately compensated through the Landscaping and Biodiversity Management and Enhancement Plan (LBMEP).
12	There are no changes to the magnitude of significance or introduction of any new significant effects within **Chapter 12**: Water Environment & Flood Risk resulting from the Proposed Development changes and the changes would not result in significant effects on water receptors, Water Framework Directive ('WFD') compliance, navigation or flood risk. Change 1 – An extension of the Waterborne Transport Offloading Area is proposed to incorporate land within the River Trent to enable mooring of vessels during loading/ unloading while taking into account tidal changes. The Navigation Risk Assessment already takes account of this scenario and there is no change to the assessment in **Chapter 12:** Water Environment and Flood Risk of ES Volume I (Document Ref. 6.2). Change 2 – The Applicant proposes an extension to the Additional AIL Route (Work No. 10A). This will require crossings of drainage ditches (Drain 2 and 6). Temporary steel bridges will be used to span the drainage ditches (as was the case during the construction of Keadby 2 power station). There would therefore be no hydromorphological impact to these drainage ditches relating to this change. Furthermore, through implementation of mitigation measures to protect the watercourses from runoff of fine sediment or accidental spillages during construction, as outlined in the existing Framework CEMP (Application Document Ref No 7.1) (APP-160), no water quality deterioration would be anticipated, nor non-compliance with the WFD (i.e., no deterioration against WFD status in the wider catchment or prevention of future improvement in WFD status). Change 3 – There would be no material change to the significance of effects on water dependent ecological sites arising from atmospheric deposition of emissions from the increased height of the twin absorbers/ stacks. The dispersion modelling of the twin

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
	absorber stacks indicates that while the concentrations of NOx and NH3 are very slightly higher at the majority of the ecological receptors assessed, the overall level of impact remains comparable to those presented with Chapter 8: Air Quality of ES Volume I (Document Ref. 6.2.8) [APP-051]. Change 4 – There would be no new or different significant construction or operational effects to the water environment and flood risk, in comparison with Chapter 12: Water Environment and Flood Risk of ES Volume I. Change 5 – There would be no new or significantly different construction or operational effects to the water environment and flood risk, in comparison with Chapter 12: Water Environment and Flood Risk of ES Volume I.
13	There are no changes to the magnitude of significance or introduction of any new significant effects within **Chapter 13:** Geology, Hydrogeology and Land Contamination resulting from the changes to the indicative Order Limits and the changes would not result in significant effects on geology, hydrogeology or contaminated land.
14	There are no changes to the magnitude of significance or introduction of any new significant effects within **Chapter 14:** Landscape and Visual Amenity resulting from the changes to the indicative Order Limits. Change 1: There would be no new or different significantly construction or operational effects to landscape and visual amenity receptors as a result of the Proposed Development Changes. Change 3: It is expected that Proposed Development Change 3 would result in a marginal increase in massing of tall structures but would result in no change in the overall nature of views from identified representative viewpoints. It is judged that there would be no increase in

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
	the level of impact on receptors in comparison to the single absorber column/ stack (assessed as worst-case scenario) within **Chapter 14:** Landscape and Visual Amenity of ES Volume I. Change 4: Construction operations including plant and activity associated with the Proposed Development Change would be of a similar scale and nature to those assessed in the Original ES and would not change the assessment of construction effects. No new significant construction effects on landscape and visual amenity receptors are judged to occur as a result of the Proposed Development Change. The Proposed Development Change would result in the marginal increase in visibility of one of the structures, but it is judged that this Change would not increase the level of impact on receptors and there would be no change to the level of significance of effect on landscape receptors, visual receptors and dynamic views. Change 5 – no change. The Proposed design changes do not result in new or a change to existing significant effects for decommissioning and do not require any additional mitigation, monitoring or enhancement measures.
15	**Chapter 15:** Cultural Heritage Change 1 – no change. Change 2: This has the potential to impact previously unrecorded below ground archaeological remains. Appendix 15A: Cultural Heritage Desk-based Assessment identified a high potential for encountering previously unrecorded archaeological remains dating to the Roman period and a medium potential for archaeological remains dating to the prehistoric period. Any such remains would be of medium value. The Proposed Development Change could result in the assets being significantly altered or modified which would constitute a medium magnitude of impact, resulting in a moderate adverse effect, which is significant. No additional mitigation measures are required above those stated in **Chapter 15:** Cultural Heritage of the Original ES, as this sets out that mitigation measures for

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
	archaeological assets which will experience significant adverse effects, will be considered to ensure that archaeological remains are appropriately investigated, recorded and preserved. A written scheme of investigation (WSI) would be required for any phases of archaeological evaluation, which would enable appropriate mitigation measures to be designed and implemented. Change 3: Even with the proposed increased height of the twin absorbers, the level of significance of effect on heritage assets remains lower than that assessed for the larger single absorber option presented in the Original ES; therefore, the originally assessed moderate adverse effect, as identified in **Chapter 15:** Cultural Heritage of the Original ES, remains. There are no new or different significant operational effects to cultural heritage as a result of the Proposed Development Changes in comparison with **Chapter 15:** Cultural Heritage of the Original ES. There are no new or different significant decommissioning effects to cultural heritage as a result of the Proposed Development Changes in comparison with **Chapter 15:** Cultural Heritage. No additional mitigation measures are required as a result of the Proposed Development changes, above those stated in **Chapter 15:** Cultural Heritage of the Original ES.
16	There are considered to be no changes to **Chapter 16:** Socio-Economics and **Appendix 16A:** Population and Health Signposting and Human Health conclusions resulting from the Proposed Development Changes. **Appendix 16A**: Human Health conclusions therefore remain unchanged. Socio Economics and Population and Health were screened out of requiring further assessment within the ES Addendum.
17	There are no new significant changes or changes in magnitude to **Chapter 17**: Climate Change and Sustainability resulting from the Proposed Development Changes.

Chapter	Description of change/ likely significant effect resulting from change to the indicative Order Limits and Proposed Design Changes
18	There are considered to be no changes to **Chapter 18:** Major Accidents and Disasters resulting from the Proposed Development Changes. Major Accidents and Disasters has been scoped out of further assessment at ES Addendum.
19	There are considered to be no changes to **Chapter 19:** Cumulative and Combined Effects resulting from the Proposed Development Changes
20	There are considered to be no changes to **Chapter 20:** Summary of Likely Significant Residual Effects resulting from the Proposed Development Changes.

6.0 SUMMARY AND CONCLUSIONS

6.1.1 The ES Addendum will present the findings of the EIA assessment that will be undertaken for the Proposed Development Changes and includes an assessment of the potential environmental impacts and effects of the Proposed Development Changes during construction, operation (including maintenance, where appropriate) and decommissioning.

6.1.2 Section 6.0 of this NTS and **Chapters 8-18** (ES Addendum Volume I – **Application Document Ref.**) have considered how the Proposed Development Changes may alter the potential environmental impacts and effects of the Proposed Development (after mitigation and enhancement measures are taken into account).

6.1.3 The assessment has been undertaken following Rochdale Envelope principles whereby worst-case assumptions have been used for any aspects where the final design selection cannot yet be been made and flexibility must be retained.

7.0 REFERENCES

Department of Energy and Climate Change, Overarching National Policy Statement for Energy (EN-1) (London, The Stationery Office, 2011)

Department of Energy and Climate Change, National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) (London, The Stationery Office, 2011)

Department of Energy and Climate Change, National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (London, The Stationery Office, 2011)

Department of Energy and Climate Change, National Policy Statement for Electricity Networks Infrastructure (EN-5) (London, the Stationery Office)

Her Majesty's Stationery Office, The Planning Act 2008

Planning Inspectorate (PINS) (2018a) Advice Note Nine – Using the Rochdale Envelope

Planning Inspectorate (PINS) (2018b) Advice Note Twelve Transboundary Impacts and Process.

Planning Inspectorate (PINS) (2020) Scoping Opinion: Proposed Keadby 3 Low Carbon Gas Power Station Development

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

Scottish and Southern Electricity (SSE) (2020), A Greenprint for a Cleaner Resilient Economy