ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

Drax Bioenergy with Carbon Capture and Storage

Document Reference Number: 0.1

Applicant: Drax Power Limited

PINS Reference: EN010120

REVISION: 01

DATE: January 2021

DOCUMENT OWNER: WSP UK Limited

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PUBLIC

TABLE OF CONTENTS

FIGURES

TABLES

GLOSSARY

Term	Definition
Abnormal Indivisible Load	An 'abnormal indivisible load' (AIL) is a vehicle that has any of the following: a weight of more than 44,000 kilograms, an axle load of more than 10,000 kilograms for a single non-driving axle and 11,500 kilograms for a single driving axle, a width of more than 2.9 metres, a rigid length of more than 18.65 metres.
Above-Ground Heritage Asset	An above ground building, monument, site, place, area or **Landscape** identified as having a degree of significance meriting consideration in planning decisions, because of its **Heritage** interest. **Heritage Assets** include **Designated Heritage Assets** and **Non-Designated Heritage Assets**.
Absorber Column	For the removal of carbon dioxide from flue gases using an amine solvent. Also include a washing section, split into stages to maintain the absorbers water balance, recover chemical vapor and mist, and control chemical emissions to strict levels.
Ancient Woodland	Ancient Woodland is defined as an area that has been wooded continuously since at least 1600 AD. Ancient Woodland is divided into ancient semi-natural woodland and plantations on Ancient Woodland sites. Both types are classed as ancient woods.
Applicant	Drax Power Limited.
As Low As Reasonably Practicable (ALARP)	For a Risk to be ALARP, the cost, time or effort involved in reducing the **Risk** further would be grossly disproportionate to the benefit gained.
Baseline	A reference level of existing **Environmental Conditions** against which a project is measured and controlled.

Term	Definition
Baseline Studies	Work done to determine and describe the **Environmental Conditions** against which any future changes can be measured or predicted and assessed.
Below-Ground Heritage Asset	Below-ground heritage assets include both known and hitherto unknown buried archaeological remains.
Best Available Techniques (BAT)	The available techniques which are the best for preventing or minimising **Emissions** and **Impacts** on the environment.
Best Available Technique Reference Documents (BREF) Notes	The European Commission (EC) produces Best Available Technique reference documents or BREF notes. They contain Best Available Techniques (BAT) for installations.
Biodiversity	The biological diversity of the earth's living resources. The total range of variability among systems and organisms at the following levels of organisation: bioregional, **Landscape**, ecosystem, **Habitats**, communities, **Species**, populations, individuals, genes and the structural and functional relationships within and between these different levels.
Bioenergy with Carbon Capture and Storage (BECCS)	The technology combining energy generation from biomass with carbon capture and storage, resulting in carbon negative energy generation (net removal of carbon dioxide from the atmosphere).
Carbon Capture	The capture of carbon dioxide that would otherwise be emitted into the atmosphere from industrial sources.
Carbon Capture Plant	Infrastructure to remove carbon dioxide from the flue gas emitted by the biomass units at **Drax Power Station**.

Term	Definition
Carbon Capture Wastewater Treatment Plant (WWTP)	A new wastewater treatment plant to treat condensate recovered from the overall carbon capture system and enable its re-use.
Climate Change	Large scale, long term shift in the Earth's weather patterns or average temperature.
Construction Environmental Management Plan	Document setting out methods to avoid, minimise and mitigate Impact on the environment and surrounding area and the protocols to be followed in implementing these measures in accordance with environmental commitments during the **Construction Phase**.
Construction Phase	The stage during which construction works for the **Proposed Scheme** will take place.
Contaminated Land	Where substances are causing or have a significant possibility to cause significant harm to people, property or protected species; or, where significant pollution is being caused or has a significant possibility of being caused to controlled waters.
Construction Compound	A secure area from which **Site** work is managed and resourced, including but not limited to temporary offices, workshop, parking and storage.
Controlled Waters	As defined under the Water Resources Act 1991.
Cumulative Effects	The effects of the **Proposed Scheme** in cumulation with other existing development and/or approved development.
DCO Application	The application for development consent that will be submitted by the **Applicant**.
Development Consent Order (DCO)	A Development Consent Order (DCO) is a Statutory Instrument (SI) made by the **Secretary of State** (SoS) pursuant to the **Planning Act 2008** (as amended) (PA2008) to authorise a

Term	Definition
	Nationally Significant Infrastructure Project (NSIP).
Direct Effect	An effect that is directly attributable to the **Proposed Scheme.**
Direct Employment	An increase in local employment arising from further economic activity (jobs, expenditure or income) associated with additional local income and local supplier purchases.
Disaster	In the context of the **Proposed Scheme**, a naturally occurring phenomenon such as an extreme weather event (e.g. storm, flood, temperature) or ground-related hazard events (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a **Major Accident.**
Drax Power Station	The existing power station in Selby owned and operated by the **Applicant**.
Drax Repower	The project consented by the Drax Power (Generating Stations) Order 2019 for the construction, operation and maintenance of up to new combined cycle gas turbine (CCGT) generating units in place of two coal-fired units (known as Units 5 and 6) that will be decommissioned at **Drax Power Station**.
EIA Directive	Directive 85/337/EEC (as amended). The initial Directive of 1985 and its three amendments have been codified by Directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU has been amended in 2014 by Directive 2014/52/EU.
EIA Regulations	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
EIA Scoping Opinion	The **Secretary of State**'s written opinion as to the scope, and level of detail, of the information to be provided in the environmental statement.

Term	Definition
EIA Scoping Report	A report prepared by an Applicant to provide the information required under the **EIA Regulations** to request a **Scoping Opinion** from the **Secretary of State**.
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere.
Enhanced Regeneration Column	To reverse the carbon dioxide reaction from the amine solvent via the application of process heat, and recover the amine solvent, enabling its reuse.
Enhancement	Measures to improve the environment, such as landscape resource and the **Visual Amenity** of the **Proposed Scheme** and its wider setting, over and above its **Baseline** condition.
Environmental Impact Assessment (EIA)	A systematic means of assessing the significance of effects from the **Proposed Scheme**, undertaken in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (**EIA Regulations**).
Environmental Mitigation Area	Area within the **Site Boundary** to the north of **Drax Power Station** that may be used for environmental mitigation for the **Proposed Scheme**.
Environmental Statement (ES)	A statement prepared in accordance with the **EIA Regulations** that includes the information that is reasonably required to assess the likely effects of a development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile but that includes at least the information required in the EIA Regulations and which is prepared in accordance with the latest Scoping Opinion adopted by the Secretary of State (where relevant).

Term	Definition
European Designated Site	An area of land subject to protection through European legislation, including **Special Areas of Conservation** (SAC) and **Special Protection Areas** (SPA).
European Protected Species (EPS)	European Protected Species are animals and plants that receive protection under the Conservation of Habitats and Species Regulations 2017, in addition to the Wildlife and Countryside Act 1981 (as amended).
European Protected Species (EPS) Derogation Licence	A licence issued to permit an activity affecting **European Protected Species** (EPS) that would otherwise be an offence under the **Habitats Regulations**.
Exceedance	A period of time where the concentrations of a pollutant are greater than the appropriate air quality standard.
Existing Drax Jetty	The jetty owned and operated by the **Applicant** on the River Ouse, located approximately 2.5km from **Drax Power Station** by road.
Flood Map for Planning	Defines **Flood Zones** based on annual probability of flooding from fluvial and tidal sources to inform development planning and flood risk assessment. Nationally consistent delineation of 'high', 'medium' and 'low' flood risk updated by the Environment Agency as deemed appropriate, typically on a quarterly basis.
Flood Risk Assessment (FRA)	An assessment of the risk of flooding.
Flood Zones	Zones based on the annual probability of flooding from fluvial and tidal sources, as defined in the **Flood Map for Planning**. Areas are categorised into one of the following: **Flood Zone 1, Flood Zone 2, Flood Zone 3a** or **Flood Zone 3b.**

Term	Definition
Flood Zone 1	This zone comprises land assessed as having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers or the sea in any year.
Flood Zone 2	This zone comprises land assessed as having between a 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of flooding from rivers, or between a 1 in 200 (0.5%) and 1 in 1,000 (0.1%) annual probability of flooding from the sea in any year.
Flood Zone 3a	This zone comprises land assessed as having a 1 in 100 (1%) or greater annual probability of flooding from rivers or a 1 in 200 (0.5%) or greater annual probability of flooding from the sea in any year.
Flood Zone 3b	This zone comprises land where water has to flow or be stored in times of flood.
FGD Planning Application	Full planning application (2020/0994/FULM) submitted under the Town and Country Planning Act 1990 for demolition of Flue Gas Desulphurisation (FGD) Plant and associated restoration works at **Drax Power Station**.
Future Baseline	The likely evolution of the **Baseline** without implementation of the **Proposed Scheme**.
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.
Greenhouse Gas (GHG)	Gas that absorbs and emit reflected solar radiation which result in the warming of the Earth's atmosphere. It is absorbed and emitted at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. The six main GHGs whose emissions are human-caused are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon and sulphur hexafluoride. In combination, these

Term	Definition
	GHG emissions are commonly expressed in terms of 'carbon dioxide equivalents' (CO_2e) according to their relative global warming potential. For this reason, the shorthand 'carbon' may be used to refer to GHGs.
Groundwater Source Protection Zone (SPZ)	Also, **Source Protection Zone** (SPZ), defined for 2,000 groundwater sources such as wells, boreholes and springs used for public drinking water supply, show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The SPZ maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which the Environment Agency occasionally apply to a groundwater source.
Habitat	The environment in which populations or individual species live or grow.
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna.
Habitats of Principal Importance (HPI)	Semi-natural habitat types identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP).
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended) which cover the terrestrial environment and implement the **Habitats Directive**.
Habitats Regulations Assessment (HRA)	A Habitats Regulations Assessment (HRA) refers to the stages of assessment carried out by the **Competent Authority** in accordance with **Habitats Regulations** and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) to determine if a project may affect the protected features of a European site and European offshore marine

Term	Definition
	site, before deciding whether to undertake, permit or authorise it.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Heritage Asset	A building, monument, site, place, area or Landscape identified as having a degree of significance meriting consideration in planning decisions, because of its **Heritage** interest. Heritage Assets include **Designated Heritage Assets** and **Non-Designated Heritage Assets**.
Hydrology	The movement, distribution and quality of water throughout the earth.
Hydromorphology	The physical characteristics of the shape, boundaries and content of a water body.
Impact	A physical or measurable change to the environment attributable to the **Proposed Scheme**.
Index of Multiple Deprivation	The indices of deprivation measure relative deprivation in local authorities across England. The index of multiple deprivation is the most widely used of these indices.
Indirect Effect	An effect that results indirectly from the **Proposed Scheme,** as a consequence of a '**Direct Effect'**, often occurring away from the **Site**, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the **Source** of the **effect**.
Indirect Employment	Employment growth arising locally through manufacturing services and suppliers to the construction process (indirect or supply linkage multipliers).
Induced Employment	Employment associated with local expenditure as a result of those who derive incomes from the

Term	Definition
	direct and supply linkage impacts of the **Proposed Scheme**.
Internal Drainage Board	Each internal drainage board is a public body that manages water levels in an area, known as an internal drainage district, where there is a special need for drainage. They undertake works to reduce flood risk to people and property and manage water levels for agricultural and environmental needs within their district.
LAeq	Equivalent Continuous Level. When a noise varies over time, the LAeq is the equivalent continuous sound which would contain the same sound energy as the time varying sound.
Land Use	What land is used for, based on broad categories of functional land cover, such as urban and infrastructure use and the different types of agricultural and forestry.
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical processes.
Landscape	An area, as perceived by people, the character of which is a result of the action and interaction of natural and/or human factors.
Landscape And Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significant effect of change resulting from development both on the **Landscape** as an environmental resource in its own right and on people's views and **Visual Amenity**.
Landscape Character	A distinct, recognisable and consistent pattern of elements in the **Landscape** that makes one Landscape different from another.
Laydown Area	Temporary area required during the **Construction Phase** of the **Proposed Scheme** for short-term storage of materials, parking and

Term	Definition
	related activities, which will be reinstated to its original state following demobilisation. This area is within the **Site Boundary,** on land to the east of **Drax Power Station**.
LAmax	LAmax is the maximum A - weighted sound pressure level recorded over the period stated. LAmax is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall **LAeq**,T noise level but will still affect the noise environment.
Lead Local Flood Authority (LLFA)	Local authority responsible to taking the lead on local flood risk management as defined within the Flood and Water Management Act 2010.
Likely Significant Effect	The significance of an environmental effect is typically a function of the 'value' or 'sensitivity' of the receptor and the 'magnitude' or 'scale' of the impact. Combining the environmental value of the resource or receptor with the magnitude of change produces a significance of effect category. The definition of a significant effect for each environmental topic will be contained within their respective chapters of the **Environmental Statement**.
Local Development Plan (LDP)	The set of documents and plans that sets out the local authority's policies and proposals for the development and use of land in their area.
Local Nature Reserve (LNR)	A site of importance for wildlife, geology, education or public enjoyment. Some are also nationally important **Site of Special Scientific Interest (SSSI).** Local Nature Reserves must be controlled by the local authority through ownership, lease or agreement with the owner.
Local Planning Authority (LPA)	The local authority or council that is empowered by law to exercise statutory town planning functions for a particular area of the UK.

Term	Definition
Lowest Observed Adverse Effect Level (LOAEL)	The level above which adverse effects on health and quality of life can be detected as a result of noise or vibration.
Made Ground	Areas where material is known to have been placed by people on the pre-existing (natural or artificial) land surface (including engineered fill).
Magnitude	A combination of the scale, extent and duration of an effect.
Main River	A watercourse shown as such on the **Flood Map for Planning** and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river. Main Rivers are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance. Main Rivers are under the jurisdiction of the Environment Agency who have powers to carry out flood defence works to Main Rivers.
Main Stack	The existing 259 m main stack at **Drax Power Station**.
Major Accident	In the context of the **Proposed Scheme**, an event that threatens immediate or delayed serious damage to human health, welfare and / or the environment and requires the use of resources beyond those of **the Applicant** or its contractors. Serious damage includes the loss of life or permanent injury and / or permanent or long-lasting damage to an environmental **Receptor** that cannot be restored through minor clean-up and restoration efforts.
Mitigation Measures	Actions proposed to prevent, reduce and where possible, offset significant adverse effects arising from the whole or specific elements of the **Proposed Scheme.**
National Nature Reserve	Established to protect sensitive features and to provide ‘outdoor laboratories’ for research.

Term	Definition
(NNR)	
National Planning Policy Framework (NPPF)	The document that sets out Government's planning policies for England and how these are expected to be applied. The NPPF was last revised in February 2019.
National Policy Statement (NPS)	Overarching policy designated under the **Planning Act 2008** (as amended) (PA2008) concerning the planning and consenting of **Nationally Significant Infrastructure Projects** (NSIPs) in the UK.
Nationally Significant Infrastructure Project (NSIP)	Projects which fall under one of the categories in Part 3 of the **Planning Act 2008** (as amended) (PA2008) and therefore require authorisation by way of a DCO.
Nationally Designated Site	Areas of land subject to protection under UK legislation, including Sites of **Special Scientific Interest** (SSSI) and **National Nature Reserves** (NNR)
No Observed Effect Level (NOEL)	The level below which no effect from noise or vibration can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
Noise Sensitive Receptors	Any identified **Receptor** likely to be affected by noise. These are generally human Receptors, and may include residential dwellings, work places, schools, hospitals, community facilities, places of worship, recreational spaces and ecological **Receptors**.
Non-Statutory Consultation	Consultation with stakeholders on the **Proposed Scheme** which occurs in addition to the **Statutory Consultation** required under the PA 2008 and **EIA Regulations**.
Non-Statutory Consultees	Consultees who – whilst not designated in law – are likely to have an interest in a proposed

Term	Definition
	development and should therefore be consulted on the **Proposed Scheme**.
Operational Phase	The stage that occurs after the **Proposed Scheme** is handed over by the relevant construction contractors and approved for operation. It will remain in its **Operational Phase** until it is decommissioned.
Ordinary Watercourse	Any river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows that does not form part of a **Main River**. The **Lead Local Flood Authority** (LLFA) or **Internal Drainage Board** (IDB) where relevant, has powers for Ordinary Watercourses that are similar to those held by the Environment Agency for **Main Rivers**.
Phase 1 Habitat Survey	An ecological survey technique that provides a standardised system to record vegetation and wildlife **Habitats**. It enables a basic assessment of **Habitat** type and its potential importance for nature conservation.
Planning Act 2008 (PA2008)	The Planning Act 2008 (as amended).
Planning Inspectorate (PINS)	The Government agency responsible for administering applications for development consent under the **Planning Act 2008** (as amended) (PA2008) on behalf of the **Secretary of State** (SoS).
Preliminary Ecological Appraisal (PEA)	Preliminary ecological surveys have a range of purposes; one key use is to gather data on existing conditions, often with the intention of conducting a preliminary assessment of likely impacts of proposed developments or establishing the baseline for future monitoring. As a precursor to a proposed project, some evaluation is usually made within these appraisals of the ecological features present, as well as scoping for notable **Species** or **Habitats**,

Term	Definition
	identification of potential constraints to the **Proposed Scheme** and recommendations for **Mitigation Measures**.
Preliminary Environmental Information (PEI)	Information which has been compiled by **the Applicant**, and is reasonably required for the consultation bodies to develop an informed view of the **Likely Significant Environmental Effects** of the development (and of any associated development).
Preliminary Environmental Information Report (PEIR)	The Preliminary Environmental Information Report (PEIR) is the report prepared by the Applicant, containing **Preliminary Environmental Information** (PEI).
Primary Mitigation	Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken.
Principal Aquifer	These are layers of rock or drift deposits that have high intergranular and / or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, Principal Aquifers are aquifers previously designated as major aquifers.
Priority Habitat Inventory	A spatial dataset that describes the geographic extent and location of Natural Environment and Rural Communities Act (2006) Section 41 **Habitats of Principal Importance (HPI).**
Proposed Scheme	The scheme for which a DCO is sought. An extension to **Drax Power Station** comprising: • Post combustion carbon capture technology at up to two of the 600 MWe biomass units. • Transport and storage connection to National Grid infrastructure.

Term	Definition
	• Associated development. See Chapter 2 (Site and Project Description) for further details.
Ramsar Site	Wetlands of international importance, designated under the Ramsar Convention 1971.
Receptor	A component of the natural, created or built environment such as a human being, water, air, a building, or a plant that has the potential to be affected by the **Proposed Scheme**.
Residual Effects	Effects arising from the **Proposed Scheme** that cannot be mitigated following implementation of **Mitigation Measures**.
Risk	The likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor if it does occur.
Road Modifications	Possible road improvements required to facilitate movement of construction traffic and abnormal loads in particular.
Scoping	An exercise undertaken pursuant to the **EIA Regulations**, to determine the topics to be addressed within the **Environmental Statement** (ES).
Secondary Aquifer	These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary Aquifers are subdivided into two types: 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; Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised

Term	Definition
	features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers. The term 'Secondary Undifferentiated' is also used in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
Secondary Mitigation	Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or through inclusion in the **Environmental Statement**.
Secretary of State (SoS)	In case of the **Proposed Scheme**, the Secretary of State for Business, Energy and Industrial Strategy (BEIS).
Significance	A measure of the importance or gravity of the effect defined by significance criteria specific to the environmental topic.
Significant Observed Adverse Effect Level (SOAEL)	The level above which significant adverse effects on health and quality of life occur as a result of noise or vibration. (see also: **Significance**).
Site Boundary	The outer perimeter of the Site**,** as shown on Figure 1.1 – Site Boundary Plan.
Site of Importance for Nature Conservation (SINC)	Sites of Importance for Nature Conservation are usually selected within a local authority area and support both locally and nationally threatened **Habitats** and **Species** that are priorities under the county or UK Biodiversity Action Plan (BAP).
Site of Special Scientific Interest	A site statutorily notified under the Wildlife and Countryside Act 1981 (as amended) as being of

Term	Definition
(SSSI)	special nature conservation or geological interest. Site of Special Scientific Interest (SSSIs) include **Habitats**, geological features and **Landforms**.
Source Protection Zone 1 **(SPZ 1)**	Also referred to as the 'inner zone'. In relation to contamination risks to groundwater sources, defined by the Environment Agency as the 50-day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres.
Special Area of Conservation **(SAC)**	Areas of protected habitats and species as defined in the **Habitats Directive**.
Special Protection Area **(SPA)**	Sites classified in accordance with Article 4 of the EC Birds Directive (79/409/EEC) which came into force in April 1979. They are classified for rare and vulnerable birds (as listed on Annex 1 of the Directive), and for regularly occurring migratory **Species**.
Species	A group of interbreeding organisms that seldom or never interbreed with individuals in other such groups, under natural conditions; most species are made up of subspecies or populations.
Statutory Consultation	The Planning Act 2008 (as amended) (PA 2008) and EIA Regulations require an applicant to undertake public consultation in advance of submitting a **Development Consent Order** (DCO) application to the **Secretary of State** (SoS). Statutory consultation must occur with **Statutory Consultees**.
Statutory Consultees	The PA 2008 and EIA Regulations prescribe circumstances where the **Secretary of State** is required to consult specified bodies prior to a decision being made on an application. Includes bodies such as: Environment Agency, Highways Authority, Historic England, Natural England and Parish Councils, among others.

Term	Definition
Temporary Works	Those parts of the works that allow or enable construction of the **Proposed Scheme** and which do not remain in place at the completion of the works.
Tertiary Mitigation	Actions that would occur with or without input from the **EIA** feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental **Effects**.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of open urban space, including green spaces, and the relationship between buildings and open spaces.
Upgraded Drax Jetty	An upgraded facility at the location of the **Existing Drax Jetty** to facilitate transport of abnormal indivisible loads (AILs) to the site. This would include security lighting, fencing, storage and welfare facilities and laydown areas.
Visual Amenity	Overall enjoyment of a particular area, surroundings, or views in terms of peoples' activities - living, recreating, travelling through, visiting, or working.
Visual Effect	An effect on specific views and on the general visual amenity experienced by people.
Visual Receptor	Individuals and / or defined groups of people who have the potential to be affected by the **Proposed Scheme.**
Waste Hierarchy	Sets out the priorities that must be applied when managing waste.

Term	Definition
Water Framework Directive (WFD)	European directive which commits member states to achieve good qualitative status of all water bodies.
Waterbody	A discrete body of water forming a physical feature.
Wildlife and Countryside Act 1981 (as amended)	The principal piece of UK legislation relating to the protection of wildlife.
Zone of Influence (ZOI)	The areas / resources that may be affected by the biophysical changes caused by activities associated with a project.
Zone of Theoretical Visibility (ZTV)	A map, digitally produced, showing areas of land within which, the Proposed Scheme is theoretically visible.

ABBREVIATIONS

Acronym	Definition
AIL	Abnormal Indivisible Loads
ALARP	As Low As Reasonably Practicable
APIS	Air Pollution Information Service
AQMA	Air Quality Management Area
BAT	Best available technology
BECCS	Bioenergy with carbon capture and storage
BES	Building Research Establishment Environmental Sustainability Standard
BGS	British Geological Survey
BNG	Biodiversity Net Gain
BRE	British Research Establishment
BS	British Standard
CBRN	Chemical, Biological, Radiological and Nuclear
CCC	Committee on Climate Change
CCGT	Combined Cycle Gas Turbine
CD	Consultation Distance
CDE	Construction, Demolition and Excavation
CDM	Construction Design and Management
CEMP	Construction Environmental Management Plan
CERC	Cambridge Environmental Research Consultants
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists

Acronym	Definition
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CME	Coronal Mass Ejections
CO_2	Carbon dioxide
COMAH	Control of Major Accident Hazards
CoP	Code of Practice
CRoW	Countryside and Rights of Way Act 2000
CSCS	Construction Skills Certification Scheme
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CWTP	Construction Worker Travel Plan
DCO	Development Consent Order
dB	Decibel
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment Food & Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DoW	Definition of Waste
DTM	Digital Terrain Model
EA	Environment Agency
EAL	Environmental Assessment Levels
EC	European Commission

Acronym	Definition
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
ERoY	East Riding of Yorkshire
ES	Environmental Statement
FGD	Flue Gas Desulphurisation
FRA	Flood Risk Assessment
GHG	Greenhouse Gas
GLVIA 3	Guidelines for Landscape and Visual Impact Assessment
GWDTE	Groundwater dependent terrestrial ecosystem
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017
HAZID	Hazard Identification Study
HEDBA	Historic Environment Desk-Based Assessment
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HPI	Habitats of Principal Importance
HSE	Health and Safety Executive
H&S	Health and Saftety
IAQM	Institute of Air Quality Management
IDB	Internal Drainage Board
IED	Industrial Emissions Directive

Acronym	Definition
IEMA	Institute of Environmental Management and Assessment
ILA	Important Landscape Area
JNCC	Joint Nature Conservation Committee
LAQM	Local Air Quality Management
LCA	Landscape Character Area
LCRM	Land Contamination Risk Management
LCT	Landscape Character Type
LiDAR	Light Detection and Ranging
LNR	Local Nature Reserve
LSE	Likely Significant Effects
LSOAs	Lower Super Output Areas
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Sites
MA&D	Major Accidents and Disasters
MAGIC	Multi-Agency Geographic Information for the Countryside
MSA	Mineral Safeguarding Area
MW	Megawatt
MWe	Megawatt electrical
MWJP	Mineral and Waste Joint Plan
NERC	The Natural Environment and Rural Communities Act 2006
NEYEDC	North and East Yorkshire Ecological Data Centre
NGR	National Grid Reference

Acronym	Definition
NHLE	National Heritage List for England
NIA	Noise Important Area
NNR	National Nature Reserves
NPPF	National Planning Policy Framework
NPS EN-1	Overarching National Policy Statement for Energy
NPS EN-3	National Policy Statement for Renewable Energy
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NYCC	North Yorkshire County Council
OS	Ordnance Survey
PAS	Publicly Available Specification
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
PIC	Personal Injury Collision
PINS	Planning Inspectorate
PPE	Personal Protective Equipment
PRoW	Public Right of Way
RBMP	River Basin Management Plan
RCP	Representative Concentration Pathway
SAC	Special Area of Conservation
SDC	Selby District Council
SDLP	Selby District Local Plan 2005
SINC	Site of Importance for Nature Conservation

Acronym	Definition
SoS	Secretary of State
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
TA	Transport Assessment
TCPA	Town and Country Planning Act
UKBAP	UK Biodiversity Action Plan
UKCP18	UK Climate Projections 2018
VP	Viewpoint
WCA	The Wildlife and Countryside Act 1981 (as amended)
WCH	Walkers, Cyclists, and Horse Riders
WFD	Water Framework Directive
WPP	Water Preferred Policy
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility
ZVI	Zone of Visual Influence

1. INTRODUCTION

1.1. BACKGROUND

1.1.1. Drax Power Limited (the Applicant) intends to install post combustion carbon capture technology at up to two of the existing 600 MWe biomass power generating units at the Drax Power Station in Selby, North Yorkshire. This will remove up to 95% of the carbon dioxide from the flue gas, resulting in overall negative emissions of greenhouse gases.

1.1.2. Biomass will be sourced from sustainably managed forests to generate electricity. As the forests used to create biomass absorb carbon dioxide while growing, the carbon dioxide released when it is used as fuel is already accounted for, making the whole process carbon neutral. By then capturing and storing any carbon dioxide emitted in safe underground deposits, the process of electricity generation becomes carbon negative, as more carbon has been removed from the atmosphere than has been added.

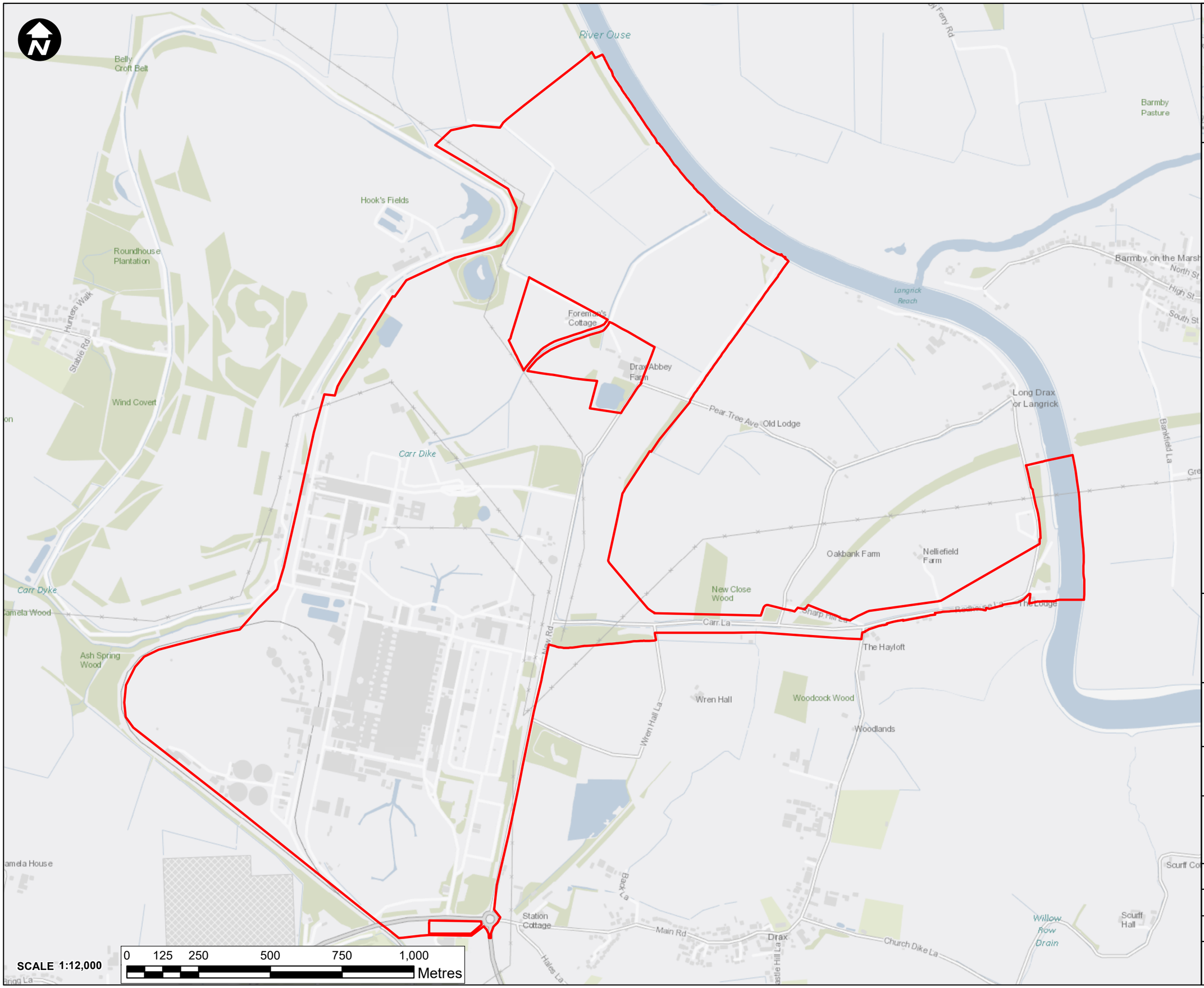
1.1.3. The Proposed Scheme includes the following:

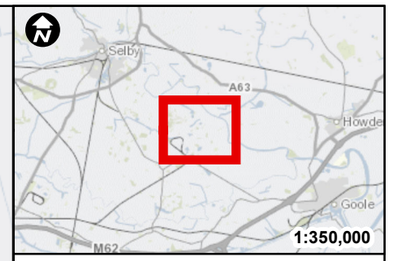
- Carbon capture infrastructure at the Drax Power Station;
- Compression and treatment of carbon dioxide at the Drax Power Station to allow connection to a National Grid carbon dioxide transport system;
- Potential Upgraded Drax Jetty and Road Improvements to facilitate the transport of abnormal indivisible loads; and
- Potential Environmental Mitigation Area to the north of the Drax Power Station.

1.1.4. A full description of the Proposed Scheme is given in Chapter 2.

1.1.5. WSP has been commissioned by the Applicant to prepare an Environmental Impact Assessment (EIA) Scoping Report in support of its request to the Secretary of State (SoS) for an EIA Scoping Opinion.

1.1.6. The EIA Scoping Report is based on the EIA Scoping Boundary and Layout Plan in Figures 1.1 and 1.2. The Site Boundary (Figure 1.1) is currently considered the maximum extent of all potential permanent and temporary works required as part of the Proposed Scheme and is likely to be refined following further environmental assessment and consultation, ahead of the submission of the DCO Application.





Key:

Site Boundary

NOTES:

drax

PROJECT TITLE

DRAX BECCS DCO

DRAWING TITLE

FIGURE 1.1 - SITE BOUNDARY PLAN

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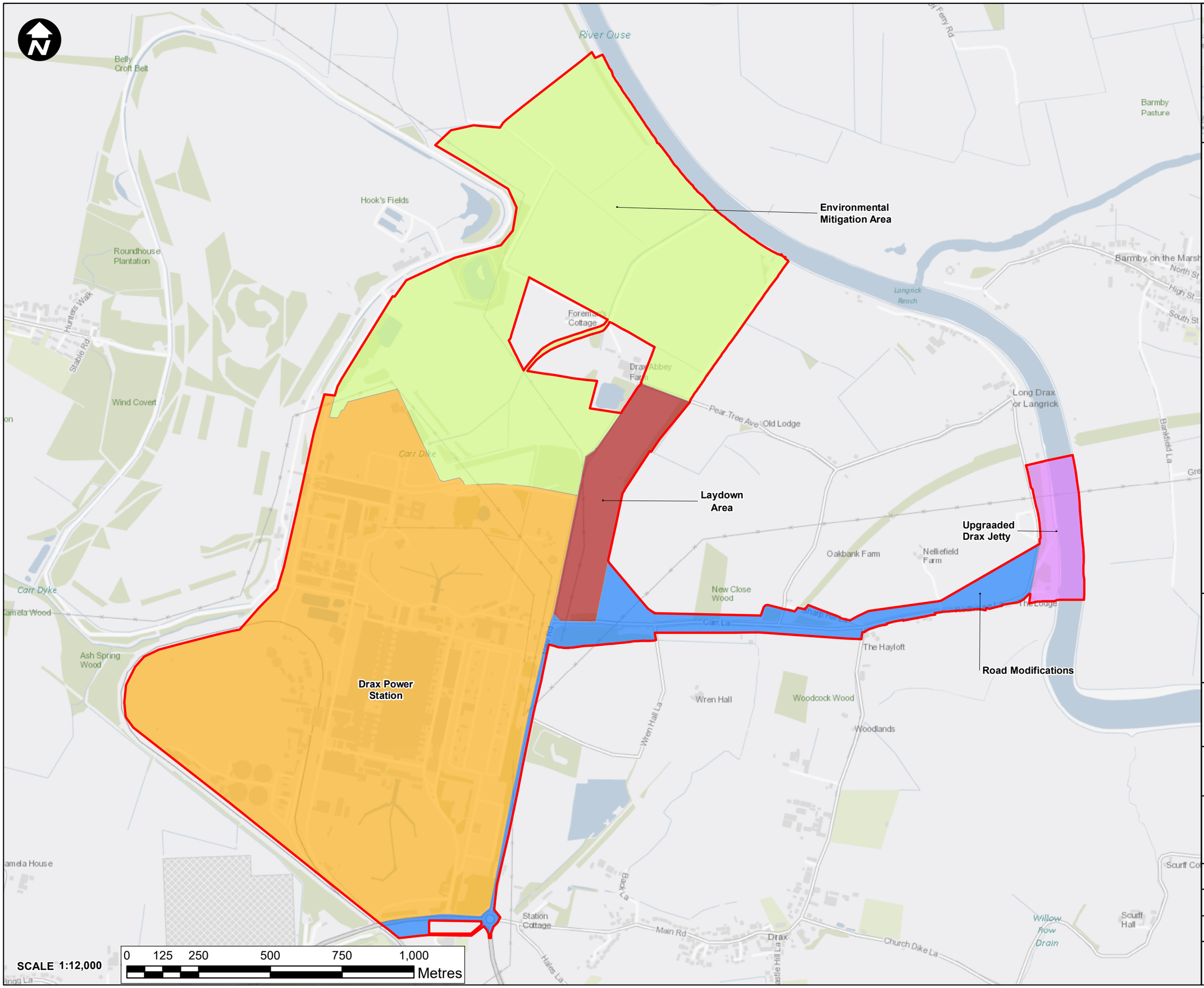

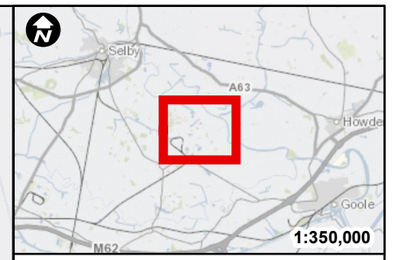

Key:

- Site Boundary

Land Use

- Drax Power Station
- Upgraded Drax Jetty
- Environmental Mitigation Area
- Laydown Area
- Road Modifications

NOTES:

drax

PROJECT TITLE
DRAX BECCS DCO

DRAWING TITLE
FIGURE 1.2 - LAYOUT PLAN

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1.2. DEFINITION OF AN EIA

1.2.1. The term ‘Environmental Impact Assessment’ (‘EIA’) describes a procedure that must be followed for certain types of project before they can be granted ‘consent’. The procedure is a means of drawing together an assessment of a project’s likely significant environmental effects. This helps to ensure that the importance of the predicted effects and the scope for avoiding, preventing, reducing or, if possible, offsetting them are properly understood by the public and the authority granting consent (the 'determining authority') before it makes its decision.

1.3. REQUIREMENT FOR A DCO

1.3.1. The Proposed Scheme is an extension of a generating station of more than 50 MW, so is a nationally significant infrastructure project (NSIP), as set out in the Planning Act 2008, Sections 14(1)(a) and 15(2). As such, the Applicant is required to request a Development Consent Order (DCO) in order to construct and operate the Proposed Scheme.

1.3.2. The Department for Energy and Climate Change (now the Department for Business, Energy and Industrial Strategy) published a number of NPSs in relation to energy infrastructure, which were designated by the Secretary of State for Energy and Climate Change in July 2011.

1.3.3. The NPSs relevant to the Proposed Scheme are set out below:

- Overarching National Policy Statement for Energy: EN-1 (NPS EN-1): This document sets out national policy for energy infrastructure as defined by the Planning Act 2008 and provides an umbrella document under which all other energy NPSs sit. The policies within this NPS, in combination with policies set out in relevant technology specific energy NPSs, provide the primary basis for decisions by the SoS and set out the need for new energy infrastructure; and
- National Policy Statement for Renewable Energy: EN-3 (NPS EN-3): This policy must be considered together with the ‘Overarching NPS for Energy’ (EN-1) as set out above. It provides the primary basis for decisions by the SoS on applications it receives for applications it receives on nationally significant renewable energy infrastructure.

1.4. REQUIREMENT FOR EIA

1.4.1. The Proposed Scheme falls under Schedule 1, paragraph 23 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (“EIA Regulations) as *‘Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31/EC from installations referred to in this Schedule, or where the total yearly capture of carbon dioxide is 1.5 megatonnes or more.’*. The Proposed

Scheme will capture 4.1 megatonnes of carbon dioxide per annum per biomass unit and is therefore classified as 'EIA development' and as such the DCO Application will be supported by an EIA.

1.4.2. The Proposed Scheme has not been subject to an EIA Screening Request or Opinion, as all development listed within Schedule 1 is automatically classified as EIA development under the EIA Regulations 2017.

1.4.3. A Regulation 8 (of the EIA Regulations 2017) notification has been submitted to the SoS along with this EIA Scoping Report and confirms that the Applicant intends to submit a DCO Application in February 2022.

1.5. PURPOSE OF THE EIA SCOPING REPORT

1.5.1. The purpose of this EIA Scoping Report is to ensure that the subsequent EIA is focused on the key impacts likely to give rise to significant effects, and to obtain agreement on the EIA approach and scope. As well as identifying elements to be considered in the EIA, this report also identifies those elements that are not considered necessary to assess further. This approach is in line with the general aim to undertake proportionate EIA, as advocated by industry best practice and as set out in paragraph 5.10 of the Planning Inspectorate's (PINS) Advice Note 7 (Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements) (Planning Inspectorate, 2020).

1.5.2. This report seeks to establish the overall framework for the EIA in relation to the environmental factors and associated effects and the ES will be based on the EIA Scoping Opinion received. However, the exact scope of the EIA will be influenced by the on-going design evolution of the Proposed Scheme, baseline data collection (e.g. field surveys etc.) and consultation with stakeholders. Where further evidence justifies a change to the scope of the EIA, this will be explained in the ES along with confirmation of whether the change has been agreed with relevant consultees.

1.5.3. Table 1-1 below sets out what information the EIA Regulations 2017 (Regulation 10(3)) state that a request for an EIA Scoping Opinion must include and where this information can be found in this report.

Table 1.1 – Information Required to Accompany a Request for an EIA Scoping Opinion

Information Required	Location within this Report
A plan sufficient to identify the land	Figure 1.1

Information Required	Location within this Report
A description of the nature and purpose of the development, including its location and technical capacity	Chapters 1 and 2 of this Report
An explanation of the likely significant effects of the development on the environment	Chapters 4 – 16 of this Report

1.5.4. In addition to the above, Regulation 10(3) of the EIA Regulations also requires '*such other information or representations as the person making the request may wish to provide or make'*. This additional information is set out in Table 1-2 below.

Table 1.2 – Other Information Provided within this EIA Scoping Report

Information Required	Location within this Report
An overview of the conditions presents on site and in the surrounding area, together with a brief overview of the relevant planning policy context	Chapters 4-16
Outline of the scope and assessment methodology (including the significance criteria to be adopted) for assessing the likely significant environmental effects to be employed for each aspect to be reported in the ES.	Chapter 3
The approach to dealing with alternatives	Chapter 3
The approach to undertaking the cumulative assessment	Chapter 17
The proposed approach to the EIA and an appraisal of the key environmental aspects and matters to be covered in the EIA (i.e. "scoped in") and the aspects and matters not requiring further consideration (i.e. "scoped out").	Chapters 3-16
The proposed structure and format of the ES which will comprise three main parts: • Volume 1 – Main Text and Figures • Volume 2 – Technical Appendices • Volume 3 – Non-Technical Summary	Chapter 3

1.5.5. The outputs of the EIA will be twofold:

- A Preliminary Environmental Information Report (PEIR), produced in connection with the formal statutory consultation on the Proposed Scheme. The PEIR will present the current understanding of the potential likely significant effects of the Proposed Scheme at the time of the consultation and its purpose will be to provide information that enables interested parties, including members of the public, local authorities and statutory bodies, to understand the likely environmental effects so that they can provide meaningful feedback.; and
- The PEIR will be followed by the ES, which will be produced in support of the DCO Application. The ES will report on a detailed assessment of the likely significant effects resulting from the Proposed Scheme and the proposed mitigation measures.

2. SITE AND PROJECT DESCRIPTION

2.1. SITE DESCRIPTION

DRAX POWER STATION

2.1.1. Drax Power Station was originally built, owned and operated by the Central Electricity Generating Board. It had a capacity of just under 2,000 MW when Phase 1 was completed in 1975, increasing to 4,000 MW from six coal-fired units after the construction of Phase 2 in 1986.

2.1.2. It is now owned and operated by Drax Power Limited (Drax). Four of the six units run on biomass, making Drax Power Station the UK's largest single site renewable power generator.

2.1.3. The two remaining units run on coal, but commercial coal generation is expected to end in March 2021, with formal closure of the coal units in September 2022 at the end of existing Capacity Market obligations.

2.1.4. Drax has a Development Consent Order (DCO) (The Drax Power (Generating Stations) Order 2019), which allows Drax to repower up to two of the existing coal-powered generating units with new gas turbines that can operate in both combined cycle and open cycle modes. The new units would have a new combined capacity of up to 3,600 MW in combined cycle mode (1,800 MW each).

2.1.5. Drax has also applied for full planning permission under the Town and Country Planning Act 2009 for the demolition of redundant Flue Gas Desulphurisation (FGD) Plant and associated restoration works at Drax Power Station.

2.1.6. The Drax Power Station site is characterised by a number of large structures, including the main generating station buildings, a main emissions stack of 259 m in height, 12 cooling towers each of 116.5 m in height (six to north and six to south of the generating station buildings), offices, storage buildings and ash handling facilities, as well as overhead electricity cables and rail infrastructure.

EXISTING DRAX JETTY

2.1.7. The Existing Drax Jetty is located along the River Ouse, approximately 2.5 km by road from Drax Power Station. It was built to facilitate the construction of the original power station. it is thought to be capable of handling loads up to 200 tonnes but is not in regular use. There has been considerable siltation of the berth and riverbank, allowing growth of vegetation around the berth. The Existing Drax Jetty is accessed by road from the Drax Power Station via New Road, Carr Lane and Redhouse Lane.

ENVIRONMENTAL MITIGATION AREA

2.1.8. Land to the north of the Drax Power Station within the Site Boundary consists of mainly agricultural fields. New Road landfill site, a historic landfill, is located to the north east of the Drax Power Station within the Site Boundary.

2.1.9. Drax Augustinian Priory scheduled monument, Foreman's Cottage and Drax Abbey Farm fall outside of the Site Boundary but are bounded by it on all sides.

SURROUNDING AREA

2.1.10. Drax Power Station is surrounded by the villages of Drax, approximately 700 m to the south east, Long Drax approximately 900 m north east, Hemingbrough approximately 2 km north and Camblesforth approximately 1 km south west. Larger towns in the vicinity of the Drax Power Station are Selby approximately 5 km north west and Goole approximately 7.5 km south east.

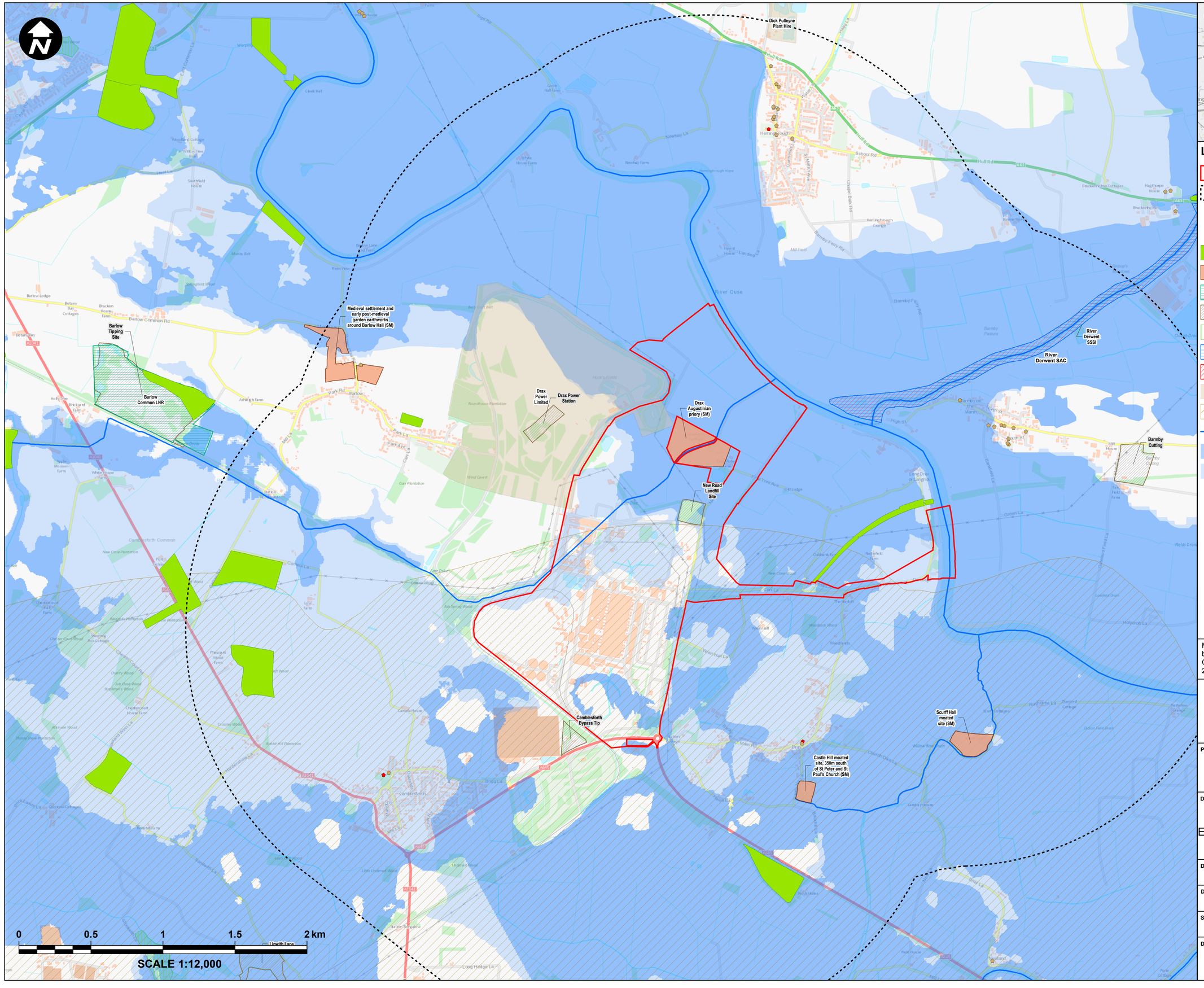
2.1.11. Rusholme Wind Farm is located approximately 3.8 km to the east of Drax Power Station and Drax Golf Club is across the A645 to the south. There is an industrial site adjacent to the Drax Power Station to the south west. Drax Skylark Centre and Nature Reserve are located to the north west.

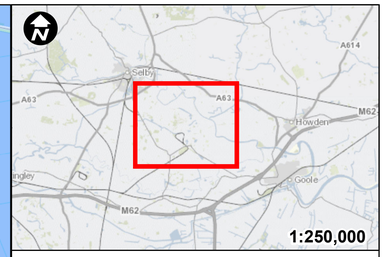
2.1.12. The nearest major surface water feature is the River Ouse, located approximately 1.5 km north east of the Drax Power Station. Approximately 3.5 km downstream from this location, the River Ouse forms part of the Humber Estuary Ramsar site, Special Area of Conservation (SAC), Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI). The River Derwent is the closest SAC, approximately 700 m to the north of the Drax Power Station. There are various other sites designated for their biodiversity value within the area.

2.1.13. Public Rights of Way (PRoW) run adjacent to the western and northern borders of the Drax Power Station. A PRoW network extends across much of the surrounding area, with a high concentration between the village of Drax and the River Ouse. The Trans-Pennine trail long distance path and the Sustrans Route 65 run on the eastern bank of the River Ouse.

2.1.14. The road network adjacent to the Drax Power Station includes the A1041 and the A645, which connect the Drax Power Station to the wider road network including the M62 Junction 36, approximately 6 km south. Minor roads connect the Drax Power Station to the villages of Drax, Newland and isolated properties.

2.1.15. Further details on environmental constraints are shown in Figure 2.1. Local designations from the East Riding of Yorkshire Council will be confirmed during the assessment.





Legend

- Site Boundary
- 2km Buffer of Site Boundary
- Grade I Listed Building
- Grade II Listed Building
- Site of Importance for Nature Conservation
- Scheduled Monument
- Local Nature Reserve
- Historic Landfill
- Ancient Woodland
- Special Area of Conservation
- Site of Special Scientific Interest
- Authorised Landfill
- Source Protection Zone III - Total Catchment
- WFD Waterbody
- Flood Zone 3
- Flood Zone 2

drax

PROJECT TITLE

Drax BECCS DCO

DRAWING TITLE

FIGURE 2.1 – ENVIRONMENTAL CONSTRAINTS PLAN (PAGE 1 OF 1)

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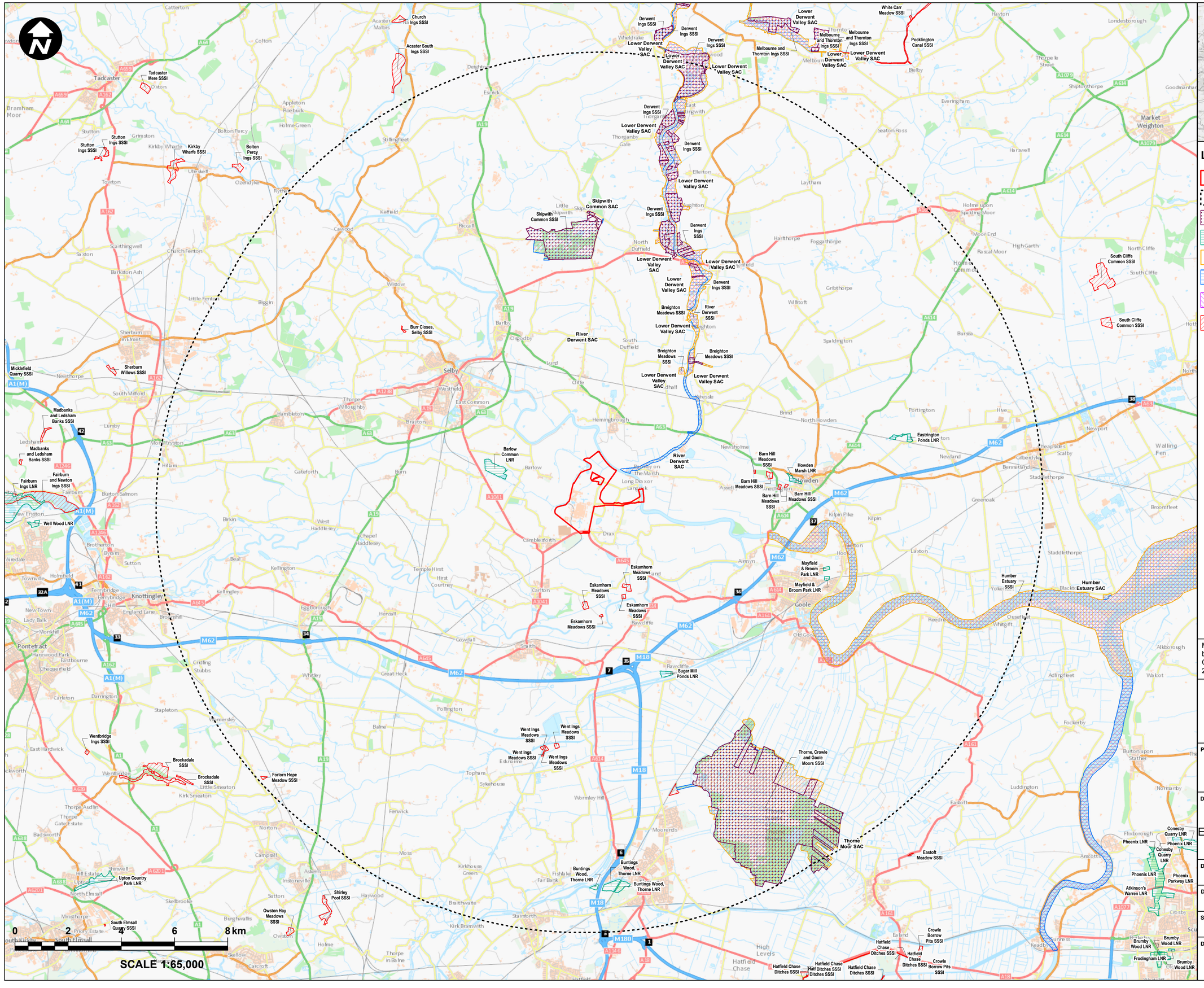

Legend

- Site Boundary
- 15km Buffer of Site Boundary
- National Nature Reserve (Eng)
- Local Nature Reserve
- Special Protection Area (SPA)
- Special Area of Conservation
- Ramsar Site - Wetland of International Importance
- Site of Special Scientific Interest

drax

PROJECT TITLE

Drax BECCS DCO

DRAWING TITLE

FIGURE 2.1 – ENVIRONMENTAL CONSTRAINTS PLAN (PAGE 2 OF 2)

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2.2. PROJECT DESCRIPTION

DRAX BIOENERGY WITH CARBON CAPTURE AND STORAGE

2.2.1. Producing negative emissions from energy generation infrastructure is a vital part of the solution to Climate Change, which also includes decarbonising all sectors of the economy, deploying more renewable resources (such as hydrogen) and use of electric vehicles, as well as improving energy efficiency and changing the way we live.

2.2.2. Bioenergy with carbon capture and storage (BECCS) is the most scalable negative emissions technology available today to reduce the amount of carbon dioxide released into the atmosphere. BECCS will use biomass sourced from sustainably managed forests to generate electricity. As the forests used to create biomass absorb carbon dioxide while growing, the carbon dioxide released when it is used as fuel is already accounted for, making the whole process carbon neutral.

2.2.3. By then capturing and storing any carbon dioxide emitted in safe underground deposits, the process of electricity generation becomes carbon negative, as more carbon has been removed from the atmosphere than has been added.

2.2.4. The four existing biomass units at Drax Power Station are converted pulverised fuel boilers, capable of burning different biomass fuels. The Proposed Scheme would involve the installation of post combustion Carbon Capture technology at up to two of the 600 MWe biomass power generating units at the Drax Power Station. This will remove 95% of the carbon dioxide from the flue gas.

2.2.5. The carbon dioxide captured will be transported via the proposed National Grid Ventures pipeline for compression at Easington and storage under the southern North Sea. Transport and storage infrastructure will be consented through separate applications.

2.2.6. It is intended that core items of the existing infrastructure are re-used by installing and integrating the Carbon Capture technology onto the current power generating units, cooling water systems, and Main Stack.

2.2.7. The Carbon Capture technology is made up of the following:

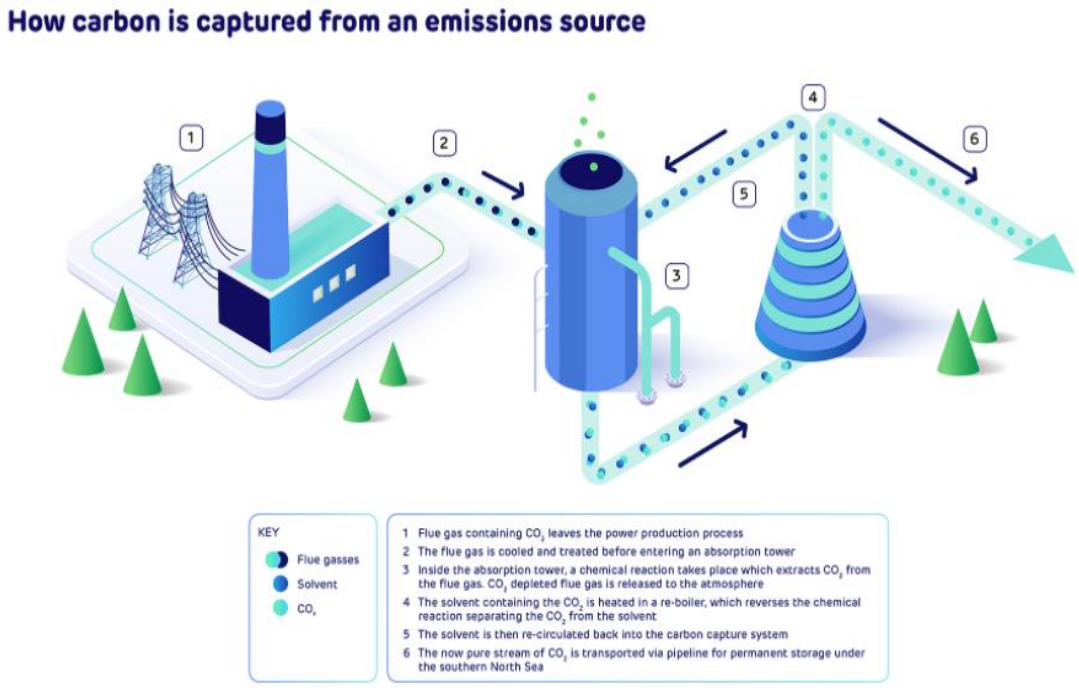
- A flue gas pre-treatment section, which will look to extract and utilise waste heat from the flue gases, alongside a quench and contaminant removal step (point 1 and 2 on Figure 2.2);
- An Absorber Column (or absorption tower on Figure 2.2) for the removal of carbon dioxide from flue gases using an amine solvent. This section will also include a washing section, split into stages to maintain the

absorber's water balance, recover chemical vapor and mist, and control chemical emissions to strict levels (point 3 on Figure 2.2);

- An enhanced regeneration column (or re-boiler on Figure 2.2) to reverse the carbon dioxide reaction from the amine solvent via the application of process heat, and recover the amine solvent, enabling its reuse (point 4 on Figure 2.2);
- A filtration and reclamation system that will continuously remove any carry over of contaminants from the flue gas into the amine solvent to maximise usage and minimise degradation;
- Solvent storage and system make-up;
- Compression, dehydration, and oxygen removal of the carbon dioxide to provide the agreed conditions for transport and permanent storage; and
- A new Carbon Capture Wastewater Treatment Plant (WWTP) to treat condensate recovered from the overall Carbon Capture system and enable its re-use.

2.2.8. Figure 2.2 below shows a generic form of Carbon Capture. For the Proposed Scheme, the emissions will be routed through the Main Stack.

Figure 2-2 - Diagram Showing a Generic Form of Post-Combustion Carbon Capture



PROCESS STEAM

2.2.9. Steam is required for the Carbon Capture process. It is used in the enhanced regeneration column to indirectly heat the carbon dioxide-rich solvent. This

reverses the forward reaction of carbon dioxide capture, producing a stream of nearly pure carbon dioxide, at the same time as enabling the recovery and re-use of the amine solvent.

2.2.10. Two options are being considered for the supply of process steam:

- Steam Option A – steam is supplied from the existing Drax boiler and steam turbine infrastructure. Infrastructure to connect the Carbon Capture technology to the existing steam supply will be required (parasitic load); or
- Steam Option B – a modification to an existing boiler/turbine on the Drax Power Station facility, which may not otherwise have operational life post 2027, to provide a combined heat and power biomass unit to provide a steam source for the Carbon Capture technology.

COOLING SOLUTION

2.2.11. Following the separation of the amine solvent and the carbon dioxide in the enhanced regeneration column, the solvent needs to be cooled before it can be reused. This is achieved via heat integration, whereby the hot regenerator outlet (regenerated amine) exchanges its heat with the cool regenerator inlet (carbon dioxide-rich amine). This heat integration within the process reduces external cooling demands, while also reducing the amount of steam required to heat the regenerator.

2.2.12. Two options are currently being considered for the cooling requirements of the Carbon Capture technology:

- Cooling Option A – cooling will be provided by using the existing cooling towers at the Drax Power Station. Drax Power Station currently uses hyperbolic (natural draught) cooling towers that are 116.5 m in height. River water is abstracted from the River Ouse and pumped to the station where it is treated to remove solids and other material. The treated river water is then used for cooling. No changes would be required to current water abstraction or discharge; or
- Cooling Option B – new cooling towers could be installed on the north side of Drax Power Station to provide cooling for compression facilities. This option will only be exercised should a low flow of 100 MW through the North Cooling tower system become unfeasible.

CHEMICAL STORAGE AND HANDLING

2.2.13. Additional chemical storage and distribution handling facilities will be required to process the amine solvent required for the Carbon Capture technology. This is expected to include new cylindrical storage tanks and warehousing for materials including amine solvent, caustic soda, anti-foam, sulphuric acid and amine solvent waste. Some hazardous waste storage is likely to be required.

COMPRESSION AND TREATMENT

2.2.14. The Proposed Scheme will adhere to the National Grid's pipeline specification, which outlines the required carbon dioxide quality, temperature and pressure. The carbon dioxide exiting the Carbon Capture Plant must be compressed and dried, and have contaminants removed before entering the transport system.

2.2.15. Multiple compression and drying options are currently being reviewed to establish their efficiency, technical and safety merits.

2.2.16. It is expected that low pressure compression will be located towards the south of the Drax Power Station. High pressure compression will be located in the former woodways towards the north of the Drax Power Station, alongside dehydration, oxygen removal, chilling, and metering to the battery limit location agreed with National Grid. New pipework would connect compression locations. The majority would use existing pipe racks that are no longer required for flue gas desulphurisation but some new pipe racks would also be required.

2.2.17. There may be a requirement for unplanned venting of carbon dioxide for safety reasons prior to the gas entering the National Grid transport system. No routine venting of carbon dioxide would take place.

2.2.18. The National Grid transport and storage infrastructure (discussed below) will be subject to separate consents and licences and does not constitute part of this application.

UPGRADED DRAX JETTY AND ROAD MODIFICATIONS

2.2.19. An upgraded facility at the location of the Existing Drax Jetty may be constructed and used to facilitate transportation of abnormal indivisible loads (AILs). If implemented, there may also be the potential to bring in other construction materials using this route. A upgraded facility would include security lighting, fencing, storage, welfare facilities and laydown areas. Capital dredging in the River Ouse would also be required. If the Upgraded Drax Jetty is used for AILs only, maintenance dredging would not be required.

2.2.20. Modifications to Redhouse Lane, Carr Lane and New Road between the Existing Drax Jetty and the Drax Power Station may be required to facilitate road transport for large plant between the two locations. This may include temporary use of agricultural land adjacent to the road.

2.2.21. The Applicant is considering whether these works will form part of the Proposed Scheme. The Applicant may instead seek planning permission for these works under the Town and Country Planning Act 1990 (and consent under other associated Acts, as required in terms of street works). Alternatively, AILs may be delivered to the Port of Goole and transferred via the Goole Bypass, across the M62 and then the A645 to Drax. In this case,

temporary removal of street furniture and overnight road closures would be required. For the purposes of this EIA Scoping Report, the two options ((1) the Upgraded Drax Jetty and associated Road Modifications and (2) use of the Port of Goole and associated road closures) have been assumed to be part of the Proposed Scheme to ensure a robust approach.

ENVIRONMENTAL MITIGATION AREA

2.2.22. Land has been identified to the north of the Drax Power Station for possible environmental mitigation. No new infrastructure is proposed on this land outside the Drax Power Station.

OTHER WORKS

2.2.23. Other works likely to be included within the Proposed Scheme are as follows:

- Demolition/removal of temporary buildings and infrastructure in areas of the Drax Power Station site where the Proposed Scheme will be constructed;
- Provision of security infrastructure including cameras;
- Site lighting infrastructure including lighting columns;
- Site drainage;
- Boundary treatments such as landscaping and ecological mitigation as necessary; and
- Potential refurbishment of existing electrostatic precipitators or demolition and reconstruction.

CARBON DIOXIDE TRANSPORT AND STORAGE

2.2.24. Following capture and treatment, carbon dioxide will be transported via a new carbon dioxide pipeline for permanent storage in naturally occurring aquifers under the southern North Sea. This pipeline will be developed by National Grid Ventures and consented under a separate DCO. However, Drax is working closely with National Grid Ventures and routeing options for the carbon dioxide pipeline are under investigation but it is likely to connect to the northern boundary of Drax Power Station.

2.2.25. It is anticipated that, carbon dioxide will be compressed at Centrica Storage's Easington site and stored under the southern North Sea using offshore infrastructure shared with the Teesside industrial cluster. This DCO Application will not seek consent for carbon dioxide storage.

2.2.26. There is the potential to realise additional cumulative benefits through the development of shared infrastructure by connecting energy-intensive industrial sites throughout the region, offering businesses the options to fuel-switch to low carbon hydrogen and capture their carbon dioxide emissions. This DCO Application will not seek consent for development at other

locations across the region, but Cumulative Effects of other known schemes will be considered in the ES.

2.3. CONSTRUCTION

CONSTRUCTION PROGRAMME

2.3.1. Construction is expected to start in early 2024 with an estimated 39-month construction programme. Unit 2 is expected to be operational in 2027 and Unit 1 in 2028.Table 2.1 below shows a preliminary construction programme. A more detailed construction programme will be presented for Statutory Consultation.

Table 2.1 - Preliminary Construction Programme

	2024				2025				2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mobilisation and Soil Removal																
Earthworks																
Civil works																
Installation																
Commissioning																

CONSTRUCTION LAYDOWN AREA

2.3.2. One or more temporary construction compounds will be required. Land has been allocated to the east of the Drax Power Station within the Site Boundary (see Figure 1.2: Layout Plan). These areas will be used during construction for construction offices, warehouses, workshops, open air storage areas and car parking. The areas will be reinstated to their original use following completion of all construction works.

CONSTRUCTION LIGHTING

2.3.3. Temporary lighting will be provided during construction.

CONSTRUCTION WORKING HOURS

2.3.4. During construction, it is expected that standard working hours will be Monday to Friday 07:00 to 19:00. Personnel will work a nine-hour period within this timeframe. On Saturdays, standard working hours will be 07:00 to 13:00.

2.3.5. It is likely that some construction activities and deliveries will be required to be 24 hours at certain times. Where work is required outside of core construction hours this will be agreed in advance with Selby District Council (SDC).

CONSTRUCTION DELIVERY AND ACCESS

2.3.6. Transport of construction materials will be via the road network from Junction 36 of the M62. If the Upgraded Drax Jetty is built, the possibility of using this facility for the import of construction materials will be considered.

2.3.7. Two routes are being considered for the transportation of abnormal indivisible loads. The first route is transport from the Port of Goole by road along the Goole Bypass, the M62 and then the A645 to Drax Power Station. For this route, Drax may require certain highways powers in order to remove barriers and to temporarily close part of the highway. The second route, applicable if an upgraded marine facility is constructed at the location of the Existing Drax Jetty, is from Port of Goole by via the River Ouse to the Upgraded Drax Jetty and then by road along Redhouse Lane and Carr Lane.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

2.3.8. Environmental mitigation required during construction will be recorded in a Register of Commitments submitted with the DCO Application. A DCO requirement will ensure measures relevant to construction are included in a Construction Environmental Management Plan (CEMP), to be prepared for the Proposed Scheme before construction begins. This CEMP will detail the environmental controls, environmental protection measures and safety procedures that will be adopted during construction. This will provide a tool to ensure the successful management of the likely environmental effects as a result of construction activities

2.4. OPERATION AND MAINTENANCE

2.4.1. Following construction, Unit 2 is expected to be operational in 2027 and Unit 1 in 2028.

OPERATIONAL LIGHTING

2.4.2. Existing lighting arrangements are in place at the Drax Power Station. It is assumed that any new lighting will comply with the same standards.

HOURS OF WORKING

2.4.3. The Proposed Scheme will be designed to operate 24 hours per day, seven days per week with planned and unplanned periods of maintenance.

SITE STAFF

2.4.4. During the Operational Phase of the Proposed Scheme staff would be required for operation and maintenance activities.

HAZARD PREVENTION AND EMERGENCY PLANNING

2.4.5. Drax is and will remain regulated under the Control of Major Accident and Hazards (COMAH) Regulations, 2015.

2.4.6. Under the COMAH Regulations, Drax has a duty to take all measures necessary to prevent Major Accidents and to limit their consequences for human health and the environment. The COMAH management system and its associated documentation will be reviewed and updated accordingly to account for the change in inventory associated with the Proposed Scheme.

2.5. DECOMMISSIONING

2.5.1. The Proposed Scheme is expected to operate for 25 years. At the end of the operation, the facility may have some residual life remaining and an investment decision may be made as to whether the operating life will be extended.

3. EIA METHODOLOGY

3.1. INTRODUCTION

3.1.1. This chapter sets out the overall approach to the EIA for the Proposed Scheme. A detailed overview of the methodology adopted for each environmental topic is provided within the respective chapters of this report. The approach to the assessment has been informed by current best practice guidance, as set out within PINS Advice Note Seven.

3.1.2. The ES will contain the information specified in Regulation 14(2)(a)-(f) and Schedule 4 of the EIA Regulations 2017. In line with Regulation 14(4)(a) of the EIA Regulations 2017, the EIA will be undertaken by a suitably qualified project team and the qualifications and experience of the team will be set out in the ES. The Institute of Environmental Management & Assessment (IEMA) has awarded WSP the EIA Quality Mark in recognition of our commitment to excellence in EIA activities. We have continued to maintain this following annual examination in relation to our products, staff, innovation and promotion of EIA within the industry.

3.2. CONSULTATION

3.2.1. As part of the EIA, consultation will be undertaken with a range of statutory and non-statutory consultees. It is anticipated at this stage that consultees will include:

- North Yorkshire County Council (NYCC);
- Selby District Council (SDC);
- East Riding of Yorkshire Council;
- Newland Parish Council;
- Drax Parish Council;
- Doncaster Metropolitan Borough Council;
- Natural England;
- Environment Agency;
- Historic England;
- Highways England;
- RSPB;
- British Trust for Ornithology;
- Wildlife Trust;
- Marine Management Organisation;
- Canal and River Trust;
- Selby Area Internal Drainage Board; and

- National Grid

3.2.2. The purpose of this consultation will be to brief consultees on the Proposed Scheme, seek feedback on the approach to assessment and obtain baseline data.

3.2.3. The Public Participation Directive 2003/35/EC, as part of the EIA Regulations, provides opportunities for the public to be involved in the consenting process for certain activities, through access to information, justice and consultation on key documents.

3.2.4. Non-statutory consultation is expected to take place in April 2021 and statutory consultation between September to November 2021. The latter consultation will be supported by a PEIR which will be developed to help consultees take an informed view of the likely significant environmental effects of the Proposed Scheme.

3.2.5. Technical and procedural consultation will continue throughout the EIA process. A summary of consultation will be included within the ES and technical consultation will be summarised within the individual technical chapters.

3.3. DEFINING THE STUDY AREA

3.3.1. The Study Area for each environmental topic is set out within the respective chapters of this report (see Chapters 4 – 16).

3.4. ESTABLISHING BASELINE CONDITIONS

3.4.1. Likely significant environmental effects will be described in the ES in relation to the extent of changes to the existing baseline environment as a result of the construction and/or operation of the Proposed Scheme. The baseline environment includes the existing environmental characteristics and conditions, based on surveys undertaken and information available at the time of the assessment.

3.4.2. Baseline conditions will be established by:

- Site visits and surveys;
- Desk based studies; and
- Modelling.

3.4.3. The baseline conditions for each environmental factor are set out within the respective chapters of this report (see Chapters 4-16).

3.4.4. The baseline conditions used in the ES will vary depending of the timing of surveys or the date at which data sources have been produced/assessed. It is anticipated that information required to inform the baseline environment for the assessments will be based on data obtained or surveys completed between October 2020 and October 2021. Where appropriate, existing baseline data

collected prior to this may be used to inform the assessment if it is deemed to remain relevant.

3.4.5. Data obtained from third party sources may be older, but the origin of all third-party data will be clearly outlined, alongside any limitations and assumptions.

3.4.6. Baseline data which is deemed to be confidential in nature, such as that relating to protected species, will be provided in separate confidential appendices to the ES, due to the sensitivity of such species records.

3.4.7. It is assumed for the purpose of this EIA Scoping Report that the baseline conditions at the Drax Power Station will include four existing Drax units running on biomass. The remaining coal units will cease operation in March 2021 and be formally decommissioned in September 2021.

LIMITATIONS

3.4.8. The period of validity for each set of baseline data collected will be set out in the ES and where appropriate the requirement for any repeat surveys will be specified, such as for species data.

3.4.9. In order to collect baseline data, it may be necessary to collect data on site. Where it is not possible to access private land, data will be collected from publicly accessible land only.

3.4.10. The COVID-19 pandemic has affected the everyday lives of the UK population in terms of travel, working arrangements and behaviour, in particular since the announcement from the UK Government on 24 March 2020 to stay at home. As a result, it is possible that any current baseline levels (e.g. typical traffic flows) may not be representative of 'normal' baseline levels. The approach to data collection in light of any COVID-19 restrictions will be confirmed and set out in the ES.

3.5. ESTABLISHING FUTURE BASELINE CONDITIONS

3.5.1. The ES will also include an outline of the likely evolution of the existing baseline without implementation of the Proposed Scheme based on available information and knowledge. This information will be set out in the description of the Proposed Scheme chapter of the ES.

3.5.2. It is assumed for the purpose of the EIA Scoping Report that the future baseline will include four existing Drax units running on biomass. It should be noted that the Drax Repower Project, associated transport and storage of carbon dioxide and other Zero Carbon Humber Cluster projects are addressed within Chapter 17 (Cumulative Effects) of this report.

3.6. CONSIDERATION OF ALTERNATIVES

3.6.1. Regulation 14(2)(d) of the EIA Regulations 2017 states that an ES should include:

'a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment'.

3.6.2. As part of the iterative design process, the Proposed Scheme will continue to evolve to take account of issues including environmental constraints and opportunities. This will be recorded within the ES as primary mitigation (see Section 3.7).

3.6.3. As the Proposed Scheme is an addition to existing infrastructure, alternative sites are not considered a viable alternative and will therefore not be appraised within the ES. The assessment of alternatives will focus on alternative technologies, infrastructure locations, the construction strategy and best available technology (BAT). The ES will consider the 'do nothing' scenario, i.e. the missed opportunities or avoidance of likely significant environmental effects associated with the Proposed Scheme.

3.6.4. The main reasons for selecting the chosen options will be provided, including a comparison of environmental effects.

3.7. APPROACH TO MITIGATION

3.7.1. The Institute of Environmental Management and Assessment (IEMA) issued 'Shaping Quality Development' in November 2015 and 'Delivering Quality Development' in July 2016. In accordance with these guidance documents, three types of mitigation will be identified and used within the ES:

- Primary mitigation – modifications to the location or design made during the pre-application phase that are an inherent part of the Proposed Scheme. These measures are treated as an inherent part of the Proposed Scheme;
- Secondary mitigation – actions that will require further activity in order to achieve the anticipated outcome. The effectiveness of such measures will be assessed within the ES and appropriate mitigation will be secured by the DCO or other suitable mechanism; and
- Tertiary mitigation – actions that would occur with or without input from the EIA. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. These measures are treated as an inherent part of the Proposed Scheme.

3.7.2. The primary and tertiary mitigation will be presented in the Proposed Scheme description in the ES and within the individual ES chapter for each environmental topic. The assessment of the likely significant environmental effects for the pre-mitigation scenario will take such mitigation into account in determining the magnitude of change.

3.7.3. Following assessment of the likely significant effects of the Proposed Scheme, any further mitigation measures (secondary mitigation) will be outlined within the individual ES chapter. These mitigation measures will further reduce a negative effect or enhance a positive one.

3.7.4. The primary, secondary and tertiary mitigation will be recorded in a summary chapter of the ES. In addition, a Register of Commitments will also document primary, secondary and tertiary mitigation to ensure suitable identification and monitoring of mitigation beyond the submission of the DCO. This will include mitigation presented in this EIA Scoping Report that is relied on to scope out issues from subsequent stages of the EIA. The delivery of these mitigation measures will be secured through requirements in the draft DCO and other suitable mechanisms, as appropriate.

3.7.5. Protective provisions are a further mechanism by which mitigation measures to protect the interests of utility owners will be secured. Relevant protective provisions will be included within the draft DCO as required.

MONITORING

3.7.6. The EIA Regulations require, where appropriate, the monitoring of potential significant adverse effects. Where monitoring arrangements are proposed as part of the mitigation set out, this will be detailed within each of the topic chapters of the ES and detailed within the Register of Commitments and draft DCO and the results of any monitoring will be shared with the relevant organisations as appropriate.

3.8. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

3.8.1. The ES will report on the likely significant environmental effects for the construction and operational (including maintenance) phases of the Proposed Scheme and will report an estimate, by type and quantity, of expected residues and emissions.

3.8.2. The design of the Proposed Scheme will continue to be progressed and there will be a need to continue refining the design up to the detailed design stage, requiring a certain level of flexibility to be maintained. Therefore, in line with PINS Advice Note Nine (Using the Rochdale Envelope) a parameter-based approach (the ‘Rochdale Envelope’ approach) will be adopted to define the envelopes within which the construction and operation of the Proposed Scheme would be undertaken. These parameters will be defined within the Application drawings and the draft DCO. The parameters approach presents the maximum envelope within which the built development may be undertaken and as assessment of the parameters ensures the comprehensive 'worst case' assessment of the full area within which the Proposed Scheme could be brought forward. This ensures the assessment of environmental effects associated with the Proposed Scheme will be the worst case, and that the actual development to be carried out within the parameters would be no worse

than the effects reported in this ES. The detailed design and construction methodology for the Proposed Scheme will be developed within these parameters without the need for further assessment (though design approvals will be required to confirm compliance with the assessed parameters)

3.8.3. The following criteria will be considered when determining significance:

- Likelihood of occurrence;
- Geographical extent;
- Adherence of the proposals to legislation and planning policy;
- Adherence of the proposals to international, national and local standards;
- Sensitivity of the receiving environment or other receptor;
- Value of the affected resource;
- Whether the effect is temporary or permanent (to be defined within the ES);
- Whether the effect is short, medium, or long-term in duration (to be defined within the ES);
- Whether the effect is reversible or irreversible (to be defined within the ES);
- Inter-relationship between effects (both cumulatively and in terms of potential effect interactions); and
- The outputs of stakeholder and public engagement.

3.8.4. The methodology for assessing the significance of an effect will vary between environmental factors but in principle, will be based on the environmental sensitivity (or value / importance) of a receptor and the magnitude of change from baseline conditions.

3.8.5. Where topic-specific guidance requires that specific criteria or scales for determining significance are to be used this will be outlined in the relevant chapter.

3.8.6. In the absence of topic-specific guidance, both the magnitude of change and sensitivity (or value / importance) will be assessed on a scale of high, medium, low and negligible. The significance of each effect will be assessed against the magnitude of change and the sensitivity (or value / importance) of the receptor or receiving environment using the matrix in Table 3-1.

Table 3.1 – Matrix for Determining Significance of Effect

		Sensitivity of Receptor / Receiving Environment to Change			
		High	Medium	Low	Negligible
Magnitude of Change	High	Major	Major to Moderate	Moderate	Negligible
	Medium	Major to Moderate	Moderate	Minor to Moderate	Negligible
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

3.8.7. When a range has been included in Table 3-1, professional judgment will be used to define the significance.

3.8.8. Only Moderate and Major effects are considered to be significant

3.8.9. Tables which summarise the likely significant effects will be provided. These tables will outline sensitive receptors, mitigation measures and residual effects. A distinction will be made between direct and indirect; short, medium and long-term; permanent and temporary; and positive and negative effects.

3.8.10. Inter-project Cumulative Effects of other existing and approved projects and intra-project combined effects will be considered in a separate section as outlined in Chapter 17 (Cumulative Effects).

3.9. ASSESSMENT OF TRANSBOUNDARY IMPACTS

3.9.1. Regulation 32 of the EIA Regulations 2017 sets out the procedural duties required where the Secretary of State deems that an NSIP is likely to have significant effects on the environment in an EEA State; or where an EEA State deems that its environment is likely to be significantly affected by an NSIP. Further guidance is provided in PINS Advice Note Twelve. As such, a description of any transboundary impacts that will be experienced as a result of the Proposed Scheme will be provided in the ES and this assessment of transboundary effects will be of effects experienced in other EEA States as a consequence of the Proposed Scheme. However, it is not anticipated that the Proposed Scheme will have significant transboundary effects.

3.10. STRUCTURE OF THE ES

3.10.1. At this stage it is anticipated that the ES will be structured as follows:

- Volume 1 – Main Text and Figures
  - Chapter 1 – Introduction
  - Chapter 2 – Description of the Study Area and Surrounding Area
  - Chapter 3 – Description of the Proposed Scheme
  - Chapter 4 – Consideration of Alternatives
  - Chapter 5 – Approach to EIA
  - Chapter 6 –Socioeconomics
  - Chapter 7 – Transport
  - Chapter 8 – Air Quality
  - Chapter 9 – Noise and Vibration
  - Chapter 10 – Ecology
  - Chapter 11 – Landscape and Visual Impact
  - Chapter 12 – Heritage
  - Chapter 13 – Ground Conditions
  - Chapter 14 – Water Environment
  - Chapter 15 – Materials and Waste
  - Chapter 16 – Greenhouse Gases
  - Chapter 17 – Major Accidents and Disasters
  - Chapter 18 – Cumulative Effects
  - Chapter 19 – Summary of the ES
- Volume 2 – Technical Appendices
- Volume 3 – Non-Technical Summary

ADDITIONAL DOCUMENTATION

3.10.2. A number of additional application documents which will not form part of the ES but which will be relied upon and referred to within the ES will be submitted as part of the DCO Application. These may include such documents as the Flood Risk Assessment (FRA), Construction Traffic Management Plan and any landscape or biodiversity strategy required.

3.11. COORDINATION OF ASSESSMENTS

3.11.1. There are several other associated assessments that will be undertaken to support the DCO Application, as follows:

HABITATS REGULATIONS ASSESSMENT

3.11.2. The overarching aim of the HRA is to determine, in view of a site's conservation objectives and qualifying interests, whether a plan, either in isolation and / or in-combination with other plans or projects, could lead to adverse effects on the integrity of an International site. Given the proximity of the Proposed Scheme to several International Sites, a HRA will be prepared. This will provide the consenting authority with sufficient information to decide whether the Proposed Scheme will lead to Likely Significant Effects (LSE)con Internal Sites. Where LSE are identified, a detailed assessment will be provided to assess whether the proposals could result in adverse effects on the integrity of relevant International sites.

3.11.3. Whilst the over-arching objectives of EIA and HRA are similar, their scope, level of detail and terminology vary. As such, these processes will be undertaken separately. However, the scope presented within this EIA Scoping Report has been developed to ensure that the needs of these processes have been considered to ensure a coordinated assessment.

BIODIVERSITY NET GAIN ASSESSMENT

3.11.4. Following industry best practice guidance, the Biodiversity Net Gain assessment will analyse the habitats to be retained, enhanced, created or lost within the Site. It will identify whether habitat compensation is required and will demonstrate biodiversity benefits resulting from the Proposed Scheme.

WATER FRAMEWORK DIRECTIVE (WFD) SCREENING REPORT

3.11.5. The Water Framework Directive (WFD) Screening Report will screen for both the potential construction and operational impacts of the Proposed Scheme upon the relevant WFD quality elements for ordinary watercourses, a transitional waterbody and objectives of the Humber River Basin Management Plan, and groundwater resources. This includes identifying likely risks to biodiversity, the biological, physico-chemical and hydromorphological quality of the River Ouse, nearby ordinary watercourses and groundwater quality, and the likely ability of good-practice methods to manage risks associated with pollutants typically experienced during construction and during the operational phase. The WFD Screening Report will determine the need for a full WFD assessment. If required, the scope for a WFD assessment will be discussed with the EA.

FLOOD RISK ASSESSMENT

3.11.6. A FRA will be prepared to support the EIA in accordance with the National Planning Policy Framework (NPPF). The FRA will qualitatively assess the potential implications of the Proposed Scheme on flood risk to people and property elsewhere, as well as assessing the potential risk of flooding to the Proposed Scheme. The FRA will be supported by a hydraulic modelling of the

proposed works, if required. The need and scope for hydraulic modelling will be discussed with the EA.

OUTLINE SURFACE WATER DRAINAGE STRATEGY

3.11.7. The FRA will be supported by an outline surface water drainage strategy, which will comprise a concept design, agreed surface water discharge rates, pollution controls and attenuation storage if required. It is not proposed to prepare detailed design drawings, network calculations or details of outfalls at this stage.

OUTLINE CONSTRUCTION TRAFFIC MANAGEMENT PLAN AND OUTLINE CONSTRUCTION WORKERS TRAVEL PLAN

3.11.8. An Outline Construction Traffic Management Plan will be prepared to provide details of procedures for construction related traffic; including; number of vehicles; routes; frequency and timing of movements; worker hours and shift patterns; laydown areas and parking, and Abnormal Indivisible Loads. An Outline Construction Workers Travel Plan will also be prepared which will focus on minimising the traffic impacts associated with construction workers travelling to and from the site.

3.12. ASSESSMENT OF HEAT AND RADIATION

3.12.1. Schedule 4 of the EIA Regulations 2017 requires a consideration of the likely significant effects of the Proposed Scheme resulting from the emission of heat, light and radiation. However, no significant sources of such emissions are anticipated and as such it is proposed to scope this topic out of the ES.

3.12.2. The effects of heatwaves, extreme weather and other external hazards will be considered within Chapter 16 (Major Accidents and Disasters).

3.13. NAVIGATIONAL RISK ASSESSMENT

3.13.1. Navigation risk will be scoped out of further assessment on the basis of the following:

- The Applicant intends to comply with all marine legislation and byelaws.
- Consultation has been undertaken between the marine contractor, Harbour Master and a River Ouse Pilot. It was agreed during these discussions that although the vessel required for movement of AILs by river will be larger than the published maximum dimensions for the River Ouse, a safe passage would be feasible. This will be confirmed with relevant consultees and documented in the ES.
- There will be approximately 10 deliveries during the construction period. No vessel movements are anticipated for the Proposed Scheme once operational.

4. CLIMATE RESILIENCE

4.1. INTRODUCTION

4.1.1. As required by Schedule 4(5) of the EIA Regulations 2017, this Chapter considers the vulnerability of the Proposed Scheme to climate change; climate change resilience and adaptation.

4.2. BASELINE CONDITIONS

4.2.1. The Institute of Environmental Management and Assessment (IEMA) EIA Guide to Climate Change Resilience and Adaptation (IEMA, 2020) identifies the need for the baseline to consider:

- The current climate baseline (defined by historic climate conditions) to provide an indication of past vulnerability; and
- The future climate baseline (short term extremes and long-term variation) to assess a project's vulnerability to climate change.

CURRENT BASELINE

4.2.2. The Proposed Scheme is located in the Met Office climate profile of North East England (Met Office, 2016), which is characterised as having a climate influenced by the high altitude of the Pennines to the west and North Sea to the east. This creates an environment that is frequently cool, dull and wet but also experiencing a "rain shadow" as the Pennines shelter the region from the prevailing westerly winds.

4.2.3. The closest weather station to the Proposed Scheme is Church Fenton (approximately 20km from Drax Power Station).

Precipitation

4.2.4. The North East of England region is drier than the UK average, averaging 80mm of rainfall per month compared to 96 mm. The local climate of Drax Power Station has experienced even less rainfall, averaging 50 mm per month (Met Office, 2010).

Extreme Precipitation

4.2.5. While the North East of England region is drier than the UK average, it does experience extreme rainfall events, classified as where rainfall exceeds 10mm per day (Jenkins, G.J., Perry, M.C., and Prior, M.J., 2008).

4.2.6. Periods of prolonged rainfall are often associated with Atlantic depressions or with convection (Met Office, 2016). The Atlantic lows are more vigorous in autumn and winter. In summer, convection caused by solar surface heating sometimes forms shower clouds and a large proportion of rain falls from showers and thunderstorms. Rainfall caused this way is normally more intense than winter rainfall which tends to be more frontal with falls occurring over

longer periods. Some noteworthy extreme rainfall, drought and storm events include:

- Heavy rainfall in July 2019: Thunderstorms from an area of low pressure caused flooding across parts of northern England. Intense downpours caused flash-flooding, with 40 to 60mm recorded in one hour across parts of North Yorkshire and around 60 to 80mm or more falling in 2 hours (Met Office, 2020).
- November 2012: a sequence of heavy rainfall events resulted in one of the wettest weeks in England in the last 50 years (Met Office, 2020). North Yorkshire experienced rainfall 164% above the November average.

Snow and Ice

4.2.7. Snowfall is closely linked with temperature, with falls rarely occurring if the temperature is higher than 4°C. For snow to lie for any length of time, the temperature must normally be lower than this. Over most of the North East of England region, snowfall is normally confined to the months from November to April, but upland areas such as the Pennines may have brief falls in October and May. Snow rarely lies outside the period from December to March. The region has experienced snow events in:

- February to March 2018: the most significant spell of snow and low temperatures for the UK overall since December 2010 (Met Office, 2020).
- December 2009 to January 2010: the UK experienced a spell of very low temperatures and significant snowfalls which affected almost the whole country (Met Office, 2020).
- December 2010: two spells of snowfall lasting around a month (Met Office, 2020).

Temperature

4.2.8. The North East of England region is cooler than the UK average with an annual temperature averaging 8ºC, compared to 9ºC for the UK. The local climate of Drax has recorded warmer temperatures compared to the UK and the region, averaging an annual 9.7ºC (Met Office, 2010).

Extreme Temperature

4.2.9. The region experiences extreme temperatures. Some noteworthy extreme temperature events include:

- July 2020: the UK experienced a short but exceptional heatwave in late July. Temperatures exceeded 30°C widely across much central and southern England on the 23rd, and across the south and east on the 24th, but the 25th was by far the hottest day with 30°C recorded through much of northern England (Met Office, 2020).

- Summer 2018: warm, dry, sunny weather with the UK under the influence of high pressure, particularly during June and July. This was the UK's warmest summer since 2006, the driest since 2003 and the sunniest since 1995 (Met Office, 2020).

Wind and Storms

4.2.10. Wind speed in the North East England region is heavily influenced by the terrain and is associated with the passage of depressions close to or across the UK. Wind speed is sensitive to altitude and local topographic effects. The period November to March has the highest mean speeds and the peak gusts follow a similar pattern.

4.2.11. Thunderstorms are most likely to occur from May to September, reaching their peak in July and August, but are less frequent than in areas further south, and the north of the region can expect only five to eight days with thunder each year. The heaviest rainfall events in the UK are often associated with these summer thunderstorms.

4.2.12. A day of gale is defined as a day on which the wind speed attains a mean value of 34 knots or more over any period of ten minutes. Notable gales affecting the region include:

- Storm Ciara was the third named storm of the 2019/2020 season and the most severe storm of the winter season. Amber warnings were issued for both strong wind and heavy rain. Winds gusted at over 60 knots widely across England and Wales and in terms of gust speeds this was the most significant storm across England and Wales overall since 12 February 2014 (Met Office, 2020).
- The UK experienced a turbulent week of weather from 10 to 16 March 2019 as a succession of Atlantic low-pressure systems brought strong winds and heavy rain, driven by a powerful jet stream. This spell included Storm Gareth on 12 to 13 March, the seventh named storm of the 2018-2019 winter (Met Office, 2020).

Sea Level

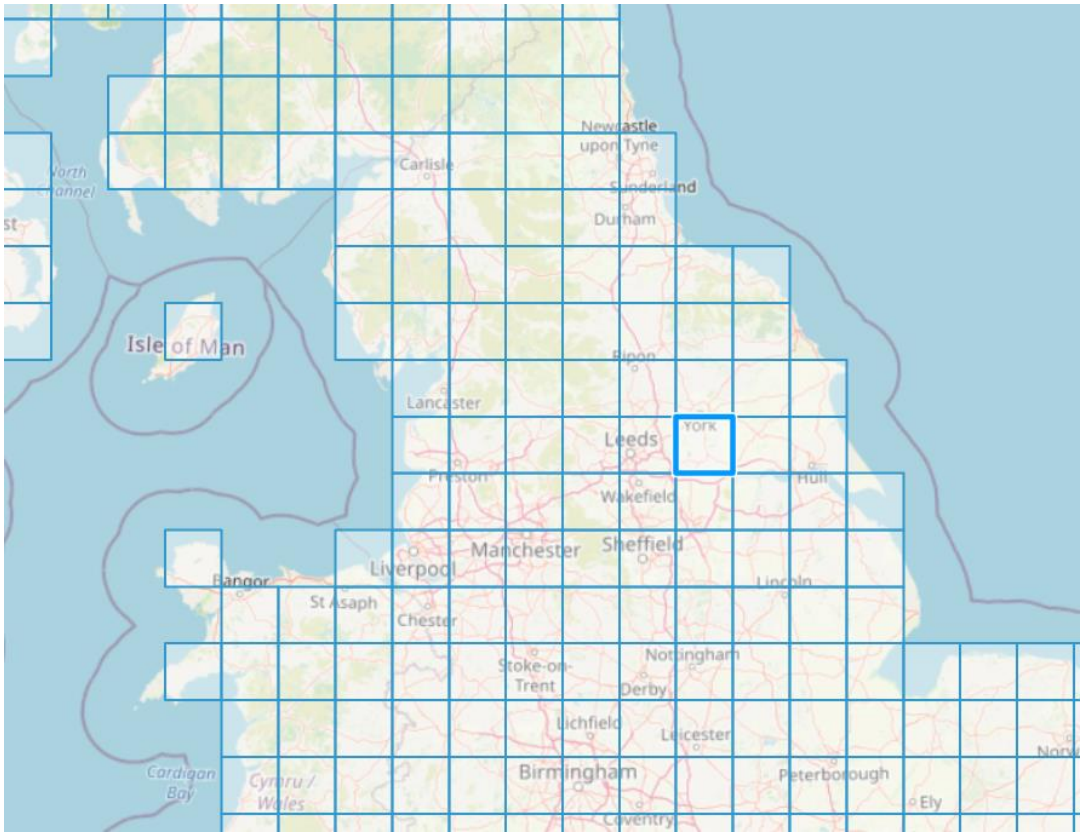
4.2.13. Drax is located within 2km of the River Ouse which flows into the Humber. The River Ouse frequently floods, with York experiencing flooding in February 2020, rising to its worst levels since bad flooding in 2015 (York Press, 2020). The Humber is situated on low-lying land and as the Humber estuary is tidal, the impact of storm surges and exceptional high tides can lead to flooding well away from the coast, as additional water is pushed into the estuary (Environment Agency, 2019).

Future Baseline

4.2.14. The UK Climate Projections 2018 (UKCP18) (Met Office, 2019) provide data on projected change in climate variables for the UK. Probabilistic projections for the

25 km grid square where the Proposed Scheme is located have been used (Figure 4-1).

Figure 4-1 - 25km Grid Square used for Probabilistic Projections



4.2.15. The UKCP18 are the most up-to-date projections of climate change for the UK, providing projections until the end of the 21st century. UKCP18 includes probabilistic projections of a range of climate variables for different emissions scenarios, termed representative concentration pathways (RCP) and for a range of time slices to the end of the century. The central estimate projections (50th percentile) are presented against baseline levels of 1981-2010s.

4.2.16. RCP8.5 is a high emissions' scenario which combines assumptions about high population and relatively slow income growth with modest rates of technological change and energy intensity improvements.

4.2.17. The future baseline has been presented for the 2020s (2010-2039), the 2050s (2040-2069) and 2080s (2070-2099) to identify the anticipated climate conditions over the construction and life of the Proposed Scheme's key components:

- Construction compound: live for the duration of the construction period of approximately three years (2024-2028).
- Proposed Scheme (including Carbon Capture Plant, Road Modifications and Upgraded Drax Jetty): minimum design life of 25 years. Conservative design

life scenario is assumed (for the purposes of this assessment) to be up to 60 years to ensure that potential changes in climate beyond the 2050s is considered.

Precipitation

4.2.18. Climate change is projected to lead to wetter winters and drier summers although natural variation, including extreme events such as storms and heatwaves, will continue to punctuate these trends. The projected changes to average summer and winter rainfall for the 2020s, 2050s and 2080s are summarised in Table 4.1.

Table 4.1 – Projected Change in Mean Summer and Winter Precipitation (%) for the 2020s, 2050s and 2080s, RCP8.5

Season	Time Slice, Precipitation Change (%)		
	2020s	2050s	2080s
Summer	-4.1%	-17.6%	-28.7%
Winter	+3.1%	+7.9%	+16.3%

4.2.19. The central estimate (50th percentile) predicts that there will be a decrease in summer rainfall for all of the time slices, with a decrease of up to 29% by the 2080s. In contrast, winter precipitation is predicted to increase by 8% for the 2050s and 16% for the 2080s.

Extreme Precipitation

4.2.20. Climate change means that more rainfall will fall during 'intense' events, particularly in winter. 'Intense' rainfall is considered where days of rainfall exceed 10mm. Projections for projected change in extreme precipitation are only available at the 2.2km scale from UKCP18 for the time periods of 2021-2040 and 2061-2080 as presented in Table 4-2.

Table 4.2 – Projected Change in Mean Extreme Summer and Winter Precipitation (%) for the 2030s and 2070s, RCP8.5

Season	Time Slice	
	2021-2040	2061-2080
Summer	-7%	-33%
Winter	+9%	+26%

4.2.21. **Table 4.2** shows that the summer months will experience a decrease in intense rainfall whilst the winter months will face an increase in extreme weather.

Snow and ice

4.2.22. With regard to future changes, rising winter temperatures are likely to reduce the amount of precipitation that falls as snow in winter. UKCP18 does not have data on snowfall, although UKCP09 (the climate projections preceding UKCP18) projects a reduction of mean snowfall, the number of days when snow falls and heavy snow events by the end of the 21st century. UKCP09 projections indicate substantial reductions in snowfall days for all regions in winter (Brown S. B., 2010).

Temperature

4.2.23. In general, UKCP18 predicts that climate change is projected to lead to hotter summers and warmer winters. **Table 4.3** summarises the UKCP18 projections for changes in mean temperature for the 25km grid square where the Proposed Scheme is located in the 2020s, 2050s and 2080s under RCP 8.5.

Table 4.3 – Projected Change in Mean Summer and Winter Temperature (°C) for the 2020s, 2050s and 2080s RCP8.5

Season	Time Slice, Precipitation Change (^{0}C)		
	2020s	2050s	2080s
Summer	+0.9°C	+2.2°C	+4.3°C
Winter	+0.7°C	+1.6°C	+3.0°C

4.2.24. The central estimate (50th Percentile) predicts that there will be an increase in summer temperature by approximately 0.9°C for the 2020s, 2.2°C for the 2050s and 4.3°C for the 2080s. Winter temperature is also predicted to increase, by 0.7°C for the 2020s, 1.6°C for the 2050s and 3.0°C for the 2080s.

Extreme Temperature

4.2.25. Table 4.4 summarises the UKCP18 projections for changes in maximum and minimum temperature for the 25km grid square in which the Proposed Scheme is located, for summer and winter in the 2020s, 2050s and 2080s under RCP8.5. Note, the values below represent mean maximum and minimum temperature changes. Therefore, individual days may exceed these values.

Table 4.4 – Projected Change in Maximum and Minimum Mean Summer and Winter Temperatures (°C) for the 2020s, 2050s and 2080s under RCP8.5 for the Proposed Scheme Area

Season	Time Slice, Temperature Change (^{0}C)					
	2020s		**2050s**		**2080s**	
	Max	Min	Max	Min	Max	Min
Summer	1.0	0.8	2.4	2.1	4.9	4.1

Season	Time Slice, Temperature Change (^{0}C)					
	2020s		2050s		2080s	
Winter	0.7	0.6	1.6	1.6	2.9	2.9

Humidity

4.2.26. Projections for humidity anticipate an increase in summer and winter humidity up to 22% by 2080. Winter is projected to see a greater increase in humidity compared to summer.

Wind

4.2.27. UKCP18 depicts a wide spread of future changes in mean surface wind speed, however, there is large uncertainty in projected changes in circulation over the UK and natural climate variability contributes much of this uncertainty (Brown S. B., 2012). It is therefore difficult to represent regional wind extreme winds and gusts within regional climate models (Bengtsson L. K., 2006).

4.2.28. Central estimates of change in mean wind speed for the 2050s are small in all ensemble runs (<0.2m/s). A wind speed of 0.2m/s (approximately 0.4 knots) is small compared with the typical magnitude of summer mean wind speed of about 3.6–5.1m/s (7 – 10 knots) over much of England (Jenkins, G.J., Perry, M.C., and Prior, M.J., 2008). Seasonal changes at individual locations across the UK lie within the range of –15% to +10%.

4.2.29. In terms of storms, the analysis presented here is a summary of expected changes in storm patterns under a changing climate. A storm is defined by the Met Office as a wind event measuring 10 or higher on the Beaufort scale (equivalent to a wind speed of 24.5m/s or 55mph) (Met Office, 2020).

4.2.30. Studies (Slingo, 2014) (Bengtsson L. &., 2006) relating to future projections of storms suggest that climate-driven storm changes are less distinct in the northern than southern hemisphere. However, such is the wide range of inter-model variation, robust projections of changes in storm track are not yet possible and there is low confidence in the direction of future changes in the frequency, duration or intensity of storms affecting the UK.

Sea Level

4.2.31. Projections for sea level rise have been ascertained using UKCP18 marine projections for the closest location to the Proposed Scheme (Figure 4-2) as presented in Table 4-5. By 2050, the area could experience sea level rise in the region of 32cm, posing flood risk to the Proposed Scheme.

4.2.32. The northern and southern part of the Drax Power Station, Carr Lane, Redhouse Lane and the area of the Existing Drax Jetty are located in the high-risk Flood Zone 3 though the area benefits from the existing flood defences on

the River Ouse. Flood Zone 3 is described as land assessed as having a 1 in 100 or greater annual probability of flooding from rivers or a 1 in 200 or greater annual probability of flooding from the sea in any year. The risk of flooding in this area is dominated by the River Ouse which is tidally influenced at this location, with minor fluvial contributions.

Figure 4-2 - Grid Square used for Marine Projections

Table 4.5 - Projected Change in Sea Level Rise (mm) for the 2020s, 2050s and 2080s RCP8.5

	Time Slice		
	2020s	2050s	2080s
Sea level increase (m)	+0.12m	+0.32m	+0.59m

4.3. STUDY AREA

4.3.1. The Study Area for climate resilience refers to the impact of climate on the Proposed Scheme (rather than the impact of the Proposed Scheme on the environment). As such, the Study Area is the Site Boundary and the immediate area around the Site Boundary (no more than 5km) (in order to address in-combination climate impacts).

4.4. SENSITIVE RECEPTORS / RESOURCES

4.4.1. In the case of climate resilience, the sensitive receptors considered within the environmental impact assessment include:

The Proposed Scheme

- Construction
  - The construction site (including access road and temporary buildings such as offices);
  - Workers;
  - Materials; and
  - Plant and equipment (including fencing, drainage and lighting)

4.4.2. The construction site would be sensitive to extreme weather such as heavy rainfall events and heatwaves. Heavy precipitation may lead to flash floods and waterlogging on the construction site, compromising any materials contained on site. Heatwave conditions may pose health risks to site workers and could disrupt the operation of plant and machinery. Structures would be sensitive to storms and heavy winds, also posing risks to workers. Such weather events may lead to delays in the construction process.

- Operation
  - Operation of the Carbon Capture Plant (as outlined in Chapter 2 (Site and Project Description))
  - Re-use of core items of the existing infrastructure (current power generating units, cooling water systems, and Main Stack)
- Other works:
  - Provision of security infrastructure including cameras.
  - Site lighting infrastructure including lighting columns.
  - Site drainage.
  - Boundary treatments such as landscaping and ecological mitigation as necessary.
- Road Modifications.

Precipitation

4.4.3. CCS infrastructure is sensitive to high and low rainfall. Drying out and cracking of materials may affect structural stability of the Absorber and Enhanced Regeneration Columns, for example. Prolonged dry periods can lead to cracking of surfaces, including the road, and more rapid deterioration of materials. Prolonged dry spells (particularly during the summer months) may also lead to low river flows which will affect the water that is available for cooling. Pluvial and fluvial flooding or high ground water levels may also cause pollutants in the soil to be mobilised, potentially affecting building materials.

Snow and ice can cause damage to above-ground infrastructure, including roofs and damage to overhead cables. Site drainage may become overwhelmed due to heavy precipitation.

Temperature

4.4.4. CCS infrastructure is sensitive to high and low temperatures through:

- Exacerbating existing faults;
- Overheating of infrastructure, leading to greater demand for cooling;
- Overheating of electronic equipment;
- Increased pressure on compression, dehydration, and oxygen removal;
- Safety risks to solvent storage;
- Deterioration of material structure and fabric;
- Damage to paved surfaces, including potential melting and deformation;
- Increased temperature of cooling water and of river flows that are used for cooling, thereby reducing efficiency of this process; and
- Security infrastructure and lighting may fail in heatwave conditions.

Wind and Storms

4.4.5. High wind speeds and gusts can have impacts on Carbon Capture Plant. It is important to note that whilst the short-term consequences of wind-related disruption are large, repairs may usually be carried out quickly. High winds and storms can affect the stability of above-ground infrastructure and hasten material degradation. High winds can also cause wind-driven rain infiltration into building materials and surfaces which can increase maintenance costs and operational disruption. Lightning strike can cause fire as well as power surges and shock waves which can destabilise energy systems, as well as causing damage to electronic and ICT equipment. The Upgraded Drax Jetty may be unsafe to operate in high wind speeds.

Relative Humidity

4.4.6. Humidity affects both the performance of the Carbon Capture Plant as well as the comfort of personnel. An increase in humidity can increase condensation, mould growth, mildew, staining and the corrosion and decay of metal surfaces, as well as poor performance of insulation.

Sea Level

4.4.7. The Carbon Capture Plant and supporting infrastructure is sensitive to changes in sea level. The Proposed Scheme lies within Flood Zone 3 therefore, flooding (fluvial and pluvial at this site) can directly cause damage to Carbon Capture Plant, potentially reducing earthwork stability and hastening the deterioration of materials. It's worth noting that flood risk may also depend strongly on the design of the new infrastructure as well as its siting. Power outages and threats

to business continuity are the main risks associated with sea level rise and storm surge.

4.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

CONSTRUCTION

4.5.1. A construction environmental management plan (CEMP) will be prepared for the Proposed Scheme before construction and secured through a requirement in the DCO. This plan will detail the environmental controls, environmental protection measures and safety procedures that will be adopted during the construction. To preclude the potential for significant adverse environmental effects during construction of the Proposed Scheme, and hence prevent the need for further assessment, the mitigation measures in Table 4.6 shall be secured fully through integration within the CEMP through a DCO requirement.

Table 4.6 – Climate Resilience Measures to be Included within the CEMP

Climate Variable	Climate Risk to the Construction Site	Mitigation to be Included in the CEMP
Temperature	Risk to the health of site workers Overheating of plant and equipment	• Ensuring welfare facilities are cooled. • Providing adequate rest, shade and Personal Protective Equipment (PPE) – such as hats and suncream – for workforce during periods of high temperature; • Switching off machinery when not in use
Precipitation	Overwhelming of drainage infrastructure Waterlogging of materials Disruption to site access and delays to the construction process as a result of flooding	• Ensuring construction compound drainage has sufficient capacity to cope with heavy rainfall events and that silt traps are in use/regularly emptied; • Sealing spoil heaps and stockpiles shortly after excavation and formation; • Minimising the material stockpiled by either using as soon as possible or removing from Site, if reuse is not an option. Where material is stockpiled on Site, this would be regularly inspected during and following extreme weather events (e.g. floods, heatwaves and storms); • Ensuring access roads used during construction are monitored,

Climate Variable	Climate Risk to the Construction Site	Mitigation to be Included in the CEMP
		especially during periods of heavy rainfall and appropriate traffic management put in place to avoid areas of potential flooding. Local advice from the council or traffic authority regarding traffic management measures that may be required during times of extreme weather would be taken and implemented.
Wind and Storms	Risk to the safety of site workers Risk to the safety of the surrounding environment Loss of materials Increase in dust	• Adjusting the programme of activities and reviewing wind speed before commencing any work at height. • Ensuring all site fencing and structures are properly secured. • Covering spoil and material heaps during periods of high rainfall or high winds; • Adopting dust control measures
Sea Level Rise	N/A. Sea level rise is not considered to be a risk to the short-term construction period.	

OPERATION

4.5.2. To preclude the potential for significant adverse environmental effects during the operation of the Proposed Scheme, and hence prevent the need for scoping and further assessment, the embedded design measures in Table 4-7 shall be secured fully through integration within the design and through DCO requirements.

Table 4.7 – Climate Resilience Measures to be Included within the Design

	Embedded Climate Resilience Measures into the Proposed Scheme design		
Scheme Asset	**Precipitation** **Sea Level Rise (Risk of Flooding)**	**Temperature (Risk of Overheating, Deterioration of Materials, Melting, Fire)**	**Wind and Storm Events**
Installation of new CCS infrastructure: • Flue gas pre-treatment section, (extract and utilise waste heat from the flue gases) • An enhanced regeneration column • Absorber column (for the removal of carbon dioxide) • A filtration and reclamation system • Washing section • Compression, dehydration, and oxygen removal • Solvent storage and system make-up • A new waste-water treatment plant	Surface water runoff generated in the new impermeable areas will be managed via appropriate drainage systems and attenuated in accordance with the requirements of the IDB and EA, if required. Within the Proposed Scheme area, it is assumed that we can use the existing drainage systems. Where necessary, the existing drainage will be upgraded to include allowances for climate change. This will be explored further at the detailed design stage by water specialists. Any significant changes to the impermeable areas of the Upgraded Drax Jetty and the road may require an appropriate outline drainage strategy. This will be	Standard design conditions in the UK gas industry are - 20°C to +60°C, all of the Proposed Scheme elements consider this requirement. Temperature monitoring will be undertaken in accordance with industry best practice. Regular inspections of infrastructure and materials will be undertaken to identify any deterioration. Regular maintenance/cleared combustibles to avoid fire spread and reduce catch risk. Fire prevention plans (or the like) in place.	Structures will be adequately designed to allow for future worst-case wind conditions. Coatings / cladding provided to minimise corrosion/ deterioration on plant and buildings. Lightning protection will be installed on all sites. All power plants and associated electrical infrastructure will be designed to meet National Grid and internationally recognised standards.

	Embedded Climate Resilience Measures into the Proposed Scheme design		
Scheme Asset	**Precipitation** **Sea Level Rise (Risk of Flooding)**	**Temperature (Risk of Overheating, Deterioration of Materials, Melting, Fire)**	**Wind and Storm Events**
	discussed and agreed with key stakeholders.	Structures will be designed with expansion joints of capacity to withstand high temperatures.	
Re-use of core items of the existing infrastructure (current power generating units, cooling water systems, and Main Stack)	The area of the existing site is mostly impermeable; hence the proposed works are unlikely to significantly increase amount of impermeable area within the site boundary. Within the existing boundary we have assumed we can use the existing drainage systems. Where necessary, the existing drainage will be upgraded to include allowances for climate change. This will be explored further at the detailed design stage by water specialists.	Regular inspections of materials to identify any deterioration. Existing infrastructure is able to withstand increases in temperature up to 4ºC hotter than average conditions and will maintain composition during heatwave conditions. Existing structures will be reviewed for their capacity to withstand high temperatures.	Existing structures will be reviewed for their ability to withstand future worst-case wind conditions. Lightning protection will be installed on all sites.
Other works • Provision of security infrastructure including cameras.	The area of the existing site is mostly impermeable; hence the proposed works are unlikely to significantly increase amount of impermeable are within the site boundary. Within the existing	Security infrastructure will be able to operate in heatwave conditions. Landscaping and vegetation growth will be maintained.	Lighting infrastructure will be designed and constructed to take into account wind loading.

	Embedded Climate Resilience Measures into the Proposed Scheme design		
Scheme Asset	**Precipitation** **Sea Level Rise (Risk of Flooding)**	**Temperature (Risk of Overheating, Deterioration of Materials, Melting, Fire)**	**Wind and Storm Events**
• Site lighting infrastructure including lighting columns. • Site drainage. • Boundary treatments such as landscaping and ecological mitigation as necessary.	boundary we have assumed we can use the existing drainage systems. Where necessary, the existing drainage will be upgraded to include allowances for climate change. This will be explored further at the detailed design stage by water specialists. Any cabling will be fully sealed to prevent water ingress damage.		Landscaping will be maintained, especially following storm events.
Upgraded Drax Jetty	The design of the Upgraded Drax Jetty will minimise works in the existing river channel as far as practicably feasible. The need and scope for the hydraulic modelling of the works proposed to the Upgraded Drax Jetty will be discussed with the EA.	n/a	Consideration of future potential increases in wind loading to be taken into account. Design and construction of the Upgraded Drax Jetty to be able to withstand increased wind loading.

	Embedded Climate Resilience Measures into the Proposed Scheme design		
Scheme Asset	**Precipitation** **Sea Level Rise (Risk of Flooding)**	**Temperature (Risk of Overheating, Deterioration of Materials, Melting, Fire)**	**Wind and Storm Events**
Road Modifications	Any significant changes to the impermeable areas of the Upgraded Drax Jetty and the roads may require an appropriate outline drainage strategy. This will be discussed and agreed with key stakeholders. No detailed calculations will be carried out as it is an outline application. The climate change allowance will be determined with the IDB and the LLFA. The drainage system will not be modelled, the application will be an outline drainage strategy. The preliminary attenuation storage calculations will be carried out if required.	Materials will be considered for surface course that will withstand temperatures up to 4°C higher than the baseline. Modelling for temperature effects have been undertaken in accordance with modern standards and incorporated into the design by the design team.	n/a

4.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION PHASE

4.6.1. Due to the short timescales of the construction period (2024-2028), it is considered that only extreme climate events such as heavy rainfall, storms and heatwaves could pose potentially significant effects to the Proposed Scheme construction as presented in Table 4.8.

Table 4.8 – Potential Significant Effects During Construction

Climate Hazard	Associated Hazard	Receptor(s) Affected	Potential Impacts
Precipitation	Extreme precipitation events	Materials; Workforce; and Site compounds.	Increased runoff from materials piles; Excessive moisture in materials; Destabilisation of material, including topsoil and spoil heaps; Increased slope instability; Increase in dust; Flooding of site; Overwhelming of drains; Waterlogging of site and excavations; and Increased surface runoff leading to surface water flooding and siltation.
Temperature	Extreme temperature events	Materials; Workforce; and Plant and equipment.	Deformation and melting of materials Shorter drying times in summer; Enhanced reactions when cement stabilising and drying of concrete; Drying out of materials; Risk of fire;

Climate Hazard	Associated Hazard	Receptor(s) Affected	Potential Impacts
			Overheating of machinery; Failure or disruption of plant and equipment; and Unsafe working conditions (heatstroke, UV levels)
Wind	Gales and extreme wind events	Materials; and Workforce.	Increase in dust; Unsafe working conditions (working at height); and Risk to cranes and working at height.
	Storms (hail, lightning)		

OPERATIONAL PHASE

4.6.2. The likely significant effects associated with the operation phase are identified in Table 4.9.

Table 4.9 – Potential Significant Effects During Operation

Climate Hazard	Associated Hazard	Receptor(s) Affected	Potential Impacts
Precipitation Sea level rise	Changes in annual average	• Carbon Capture Plant • Re-use of core items of the existing infrastructure	• Flooding of all assets resulting in loss or disruption of function and associated safety risks • Deterioration of material structure and fabric • Drying out and cracking of materials • Drainage infrastructure overwhelmed leading to surface water flooding
	Extreme precipitation events		

Climate Hazard	Associated Hazard	Receptor(s) Affected	Potential Impacts
		• Security infrastructure • Site lighting • Site drainage • Landscaping and ecological mitigation • Upgraded Drax Jetty • Road Modifications	• Drainage infrastructure blocked during periods of drought • Landscaping overwhelmed with water ingress leading to failure • Low river flows which will affect the water that is available for cooling • Mobilisation of pollutants, affecting building materials • Damage to above-ground infrastructure from snow and ice
Temperature	Changes in annual average Extreme temperature events	• Carbon Capture Plant • Re-use of core items of the existing infrastructure • Security infrastructure • Site lighting • Landscaping and ecological mitigation • Upgraded Drax Jetty	• Overheating of the Absorber and Enhanced Regeneration Columns and associated infrastructure, subsequent safety risks • Reduction in the ability of the ground to conduct heat away from underground cables during high temperatures • Overheating of the existing power generation units and stack and associated safety risks • Failure of water cooling systems and associated safety risks • Changes in water temperature and availability of water for cooling may also affect operation

Climate Hazard	Associated Hazard	Receptor(s) Affected	Potential Impacts
		• Road Modifications	• Greater demand for cooling • Risk of fire and associated safety risks • Faster rate of deterioration of materials from increase in UV radiation e.g. fading, brittleness • Failure of security infrastructure and lighting due to overheating • Loss of vegetation cover due to scorching leading to destabilisation • Longer growing season, more vigorous vegetation growth in spring and autumn • Melting or deterioration of road surfaces
Wind	Gales and extreme wind events Storms (hail, lightning)	• Carbon Capture Plant • Re-use of core items of the existing infrastructure • Security infrastructure • Site lighting • Site drainage • Landscaping and ecological mitigation	• Increase in wind loading on the stacks • Potential for safety risks should structures become weakened • Damage from high winds and rain infiltration into surfaces and materials • Increased maintenance requirements • Destabilisation of structures due to lighting strike • Power loss • Soil erosion leading to destabilisation • Windborne dust and debris clogging drainage channels and requiring clearing

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

4.6.3. The EIA Guide to Climate Change Resilience and Adaptation outlines that the scoping stage should identify the potential impact of the project on the receiving environment, the sensitivity of this environment, and taking into account how this will be affected by a changing climate.

4.6.4. From the potential impacts and design mitigation identified above, in order to ascertain the vulnerable elements of the Proposed Scheme, a sensitivity and exposure assessment has been undertaken.

4.6.5. The vulnerability of a project to climate change is considered to be a function of:

- The typical sensitivity of receptors to climate variables – based on the assets and their sensitivity explained in section 4.4, the mitigation identified in Table 4.6 and Table 4.7, literature review and expert judgement and rated as high, moderate or low; and
- The exposure of receptors to projected change in climate variables – based on the baseline information presented in section 5.2 and rated as high, medium or low.

4.6.6. The vulnerability of receptors to climate variables is determined from the combination of the sensitivity and exposure ratings, using the matrix shown in Table 4.10 - . Climate variables to which the Proposed Scheme receptors are likely to have a low vulnerability to are scoped out of further assessment and those with a medium or high vulnerability should be taken forward for further assessment in the EIA. This has been outlined in Table 4.11.

4.6.7. This is a qualitative assessment informed by expert opinion and supporting literature (IEMA, 2020) (Highways England, 2020).

Table 4.10 - Vulnerability Matrix

Sensitivity	**Exposure**		
	Low	Medium	High
Low	Low Vulnerability	Low Vulnerability	Low Vulnerability
Moderate	Low Vulnerability	Medium Vulnerability	Medium Vulnerability
High	Low Vulnerability	Medium Vulnerability	High Vulnerability

Table 4.11 – Vulnerability Assessment

Receptor	Variable		Sensitivity	Exposure	Vulnerability
Construction					
Construction site **Construction workers** **Materials** **Plant and equipment**	Precipitation	Change in annual average	Low	Low	Low
		Extreme precipitation events Drought	Low	Medium	Low
	Temperature	Change in annual average	Low	Low	Low
		Extreme temperature events	Low	Medium	Low
	Wind	Gales and extreme wind events Storms (snow, lightning, hail)	Low	Medium	Low
	Relative humidity	Changes in annual average Evaporation	Low	Low	Low
Operation					
Operation of the Carbon Capture Plant	Precipitation	Change in annual average	Low	Medium	Low
		Drought	Low	Low	Low

Receptor	Variable		Sensitivity	Exposure	Vulnerability
Re-use of core items of the existing infrastructure (current power generating units, cooling water systems, and main stack) **Provision of security infrastructure including cameras** **Site lighting infrastructure including lighting columns** **Site drainage** **Boundary treatments such as landscaping & ecological mitigation** **Upgraded Drax Jetty** **Road Modifications**		Extreme precipitation events	Low	High	Low
	Temperature	Change in annual average	Low	Medium	Low
		Extreme temperature events	Low	Medium	Low
	Wind	Gales and extreme wind events	Low	Medium	Low
		Storms (snow, lightning, hail)	Low	Medium	Low
	Relative humidity	Changes in annual average Evaporation	Low	Low	Low

4.6.11. The impacts scoped in or out for climate resilience are as follows:

Table 4.12 – Climate Resilience – Impacts Scoped In or out of further assessment

Impacts	Phase	Scoped In	Scoped Out	Justification
Impacts from climate change on the construction of the Proposed Scheme	Construction		Y	Potential construction impacts determined as low vulnerability in Table 4.11 – Vulnerability Assessment Table 4.11 – Vulnerability Assessment due to the short timescales of construction and measures integrated into the CEMP (Table 4.6) to ensure the site is prepared and responsive to extreme weather events.

Impacts	Phase	Scoped In	Scoped Out	Justification
Impacts from climate change on the operation of the Proposed Scheme	Operation		Y	Potential operational impacts determined as low vulnerability in Table 4.11 – Vulnerability Assessment due to the embedded climate resilience measures integrated into the design (Table 4.7)
In-combination climate impacts (the potential for climate change to exacerbate or diminish the potential effects identified within each of the environmental topics)	Operation	Y		This should be assessed within the cumulative chapter (once a detailed identification of effects has been undertaken. Climate change should then be considered in relation to these effects).

4.7. PROPOSED ASSESSMENT METHODOLOGY

4.7.1. As it is proposed to scope climate resilience out of further assessment, no further assessment methodology has been presented here.

4.7.2. The in-combination climate impacts will be covered by the cumulative chapter in the ES. Climate change in-combination with other environmental effects of the Proposed Scheme includes the potential for climate change to exacerbate or diminish the potential effects identified within each of the environmental topics).

4.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

4.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment has been based on Proposed Scheme information available at the time of writing.
- The UKCP18 projections have been used to infer future changes in a range of climate variables that may affect the vulnerability of the Proposed Scheme to climate change. At the time of writing, these represent the most up-to-date representation of future climate in the UK. However, the UKCP18 data currently available does not provide data for extreme precipitation, drought, snow and ice or wind.
- There are inherent uncertainties associated with climate projections and they are not predictions of the future. It is possible that future climate will differ from the future baseline climate against which the resilience of the Proposed Scheme has been assessed, depending on global emissions over the next century. A ‘high’ emissions scenario (RCP 8.5) using the 2080s time slice (2070 – 2099 - the longest temporal scale available through UKCP18) has been used to develop the baseline against which resilience has been assessed. This is consistent with the precautionary principle (i.e. ‘worst case’ scenario).
- Any further research, analysis or decision-making should take account of the accuracies and uncertainties associated with climate projections. It is also important to note that the analysis is based on selected observational data, the results of climate model ensembles and a selected range of existing climate change research and literature available at the time of assessment. Any future decision-making based on this analysis should consider the range of literature, evidence and research available at that time and any changes to this.

4.9. REFERENCES

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5. POPULATION HEALTH AND SOCIO-ECONOMICS

5.1. INTRODUCTION

5.1.1. This chapter considers the impacts of the Proposed Scheme on Population, Health and Socio economics during construction and operation and any potential significant effects. It sets out the proposed methodology for the Population, Health and Socio economics assessment and identifies those impacts that can be scoped out of the EIA.

5.2. BASELINE CONDITIONS

5.2.1. The following data sources have been consulted to inform the baseline conditions described for Population, Health and Socio economics:

- North Yorkshire Public Rights of Way Map (North Yorkshire County Council, 2019);
- North Yorkshire Population Estimates (Data North Yorkshire, 2019);
- Office for National Statistics Labour Market Profiles (NOMIS) (Nomis, 2020);
- Data North Yorkshire (Data North Yorkshire, 2019);
- English Indices of Deprivation (Ministry of Housing, Communities & Local Government, 2019);
- Public Health England Public Health Profiles (Public Health England, 2020); and
- North Yorkshire Joint Strategic Needs Assessment (North Yorkshire County Council, 2016).

EXISTING BASELINE

Population

5.2.2. The Proposed Scheme is located within the North Yorkshire County Council (NYCC) area, in the local authority of Selby (SDC) in the Yorkshire and the Humber region. The administrative boundary of East Riding of Yorkshire (ERoY) is approximately 1.7 km to the east of the Drax Power Station. The nearest settlements are the villages of Drax (approximately 700 m south east of the Site Boundary); Long Drax (approximately 900 m north east of the Site Boundary); Hemingbrough (approximately 2 km north of the Site Boundary); and Camblesforth (approximately 1 km south west of the Site Boundary).

5.2.3. The 2018 North Yorkshire Population Estimate (Data North Yorkshire, 2019) for SDC was 86,942 and was the third most populous of the seven local authority areas in NYCC. The working age population is similar to the national average, with 62% of SDC residents aged between 16-64, compared to 63.1% in England (Data North Yorkshire, 2019). The population in SDC is slightly older than the national average, with 19.7% of the population aged over 65,

compared to 17.9% in England. This is however lower than the NYCC average of 23.6% (Data North Yorkshire, 2019).

5.2.4. Of the 317 local authorities in England, SDC is ranked 252nd in terms of overall deprivation, where a rank of 1 is the most deprived and a rank of 317th is the least deprived (Ministry of Housing, Communities & Local Government, 2019). This rank places SDC in the 30% least deprived local authorities nationally.

5.2.5. The proportion of people aged between 16-64 in SDC with no qualifications is slightly lower than the national (7.7%) and regional (8.5%) averages at 6.9% (Nomis, 2020). However, those people achieving degree level qualifications (NVQ4 and above) in SDC (30.0%) is somewhat lower than both the regional (34.2%) and national (40.3%) averages (Nomis, 2020). Overall, this suggests a slightly lower skilled workforce within SDC compared with the Yorkshire and the Humber region, and the England averages.

Economy and Employment

5.2.6. In 2018, there were estimated to be 41,000 jobs in SDC, 71.4% of which were full-time and 28.6% part-time (Nomis, 2020). The service sector (Industry Sectors G-S) accounts for 69.5% jobs, with the second largest proportion of jobs in the Manufacturing sector (20.0%); notably higher than the proportion within the Yorkshire and the Humber Region (11.4%) and in England as a whole (8.0%) (Nomis, 2020).

Land Use

5.2.7. There are a number of different land uses near to the Site Boundary, including:

- Private Property and Housing: Foreman's Cottage is situated north of the Drax Power Station and falls outside of the Site Boundary, however, is bounded by the Site Boundary on all sides (see Figure 1.1). There are also a number of residential properties adjacent to the Site Boundary located along Redhouse Lane.
- Public Access for Walkers, Cyclists and Horse Riders: The Site Boundary intersects seven Public Rights of Way (PRoW):
  - 35.6/11/1 runs along the western edge of the Site Boundary which bounds the power station, and adjoins 35.47/10/1 to the north;
  - 35.47/10/1 intersects the Site Boundary west to east, and runs along the northern boundary of the power station for approximately 200m, connecting with 35.47/6/1 to the east
  - 35.47/6/1 intersects the Site Boundary west to east and runs along the northern boundary of the power station. It runs south east, ending at New Road;
  - 35.47/1/1 lies within the Site Boundary and runs north west to south east from New Road, adjoining 35.47/1/8 to the north, and 35.47/1/2 to the south;

- 35.47/1/2 lies within the Site Boundary, running north to south connecting to Carr Lane;
- 35.47/4/1 runs north to south connecting to Carr Lane. The northern end of the PRoW falls within the Site Boundary;
- 35.47/3/1 runs north west to south east connecting Pear Tree Avenue in the north to Redhouse Lane in the south. The southern end of the PRoW falls within the Site Boundary; and
- 35.47/5/2 runs southwest to northeast across agricultural land, and then runs adjacent to Redhouse Lane, ending at the River Ouse A portion of the eastern end of the PRoW falls within the Site Boundary.

- Community land and assets: The Drax Golf Club (Located on the A645) falls outside the Site Boundary, however the Golf Club car park is bounded by the Site Boundary on all sides. The majority of the club lies beyond the southern boundary of the Site Boundary (see Figure 1).
- Development land and businesses: There are two companies located within the Site Boundary: Power Minerals and CEMEX cement; both located within the eastern boundary of the power station. A number of other businesses including: Iriggatia; Willy Worms Fishing Tackle and Bait; Dove Cottage Bed and Breakfast; Empire Equestrian Embroidery; Bits n Bridles; East Yorkshire Caravan Salvage Ltd; Hales Garth Kennels and Alert Logistics; Selby Plant Hire; and English Village Salads Ltd are all situated within approximately 500m of the Site Boundary.
- Agricultural Land Holdings: Drax Abbey Farm buildings fall outside of the Site Boundary but is bounded by the Site Boundary on all sides. Agricultural land associated with Drax Abbey Farm falls within the northern portion of the Site Boundary.

Health

5.2.8. The health of people in SDC is varied compared with the England average life expectancy within SDC is 80.5 years for males and 83.5 years for females, broadly in line with figures in NYCC (80.6 years for males and 84.4 years for females) and England (79.8 years for males and 83.4 years for females) (Public Health England, 2020).

5.2.9. The Public Health England local authority profile for SDC (Public Health England, 2020) notes that certain health indicators, such as the proportion of people killed or seriously injured on the roads, and the percentage of adults (18+) classed as overweight or obese are significantly worse than the national average[1]. However, under 75 mortality from all causes, diabetes diagnosis,

[1] Significance determined by PHE

smoking prevalence in adults (18+) and the percentage of children in low income families are all significantly better than the national average.

Crime and Safety

5.2.10. NYCC has the lowest crime rate of the fifteen local authorities in the Yorkshire and the Humber region, with just 7.9% of the total crime in the region being recorded in NYCC (ONS, 2020). A total of 44,129 crimes were recorded in NYCC between June 2019 and June 2020, of which 'violence against a person' made up the highest number (37.1% of all recorded crimes). However, this is broadly in line with the NYCC average (36.8%) and slightly higher than the national (34.8%) average (ONS, 2020).

5.3. STUDY AREA

5.3.1. The relevant Study Areas for each element covered under the Population, Health, and Socioeconomics assessment are as follows:

GENERATION OF DIRECT, INDIRECT AND INDUCED EMPLOYMENT OPPORTUNITIES

5.3.2. The Homes and Communities Agency (2014) Additionality Guide (Homes and Communities Agency , 2014) provides guidance on the assessment of economic impacts, in terms of *"the additional impact or additionality of local economic growth and housing interventions. Additionality is the extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention"*. The Guide advises that *"the local level for interventions that generate employment effects or other economic benefits is often considered to be within the relevant travel to work area"*.

5.3.3. The Drax Power Station is located within SDC, but close to ERoY, and as such, construction employees could be drawn from both local authority areas. As such, it is considered appropriate to assume that employment generation at the 'local level' comprises SDC and ERoY.

5.3.4. Given the scale of the Proposed Scheme, strong transport connections, economic linkages and travel to work patterns, the employment effects of the Proposed Scheme are considered to extend beyond SDC and ERoY to the wider region. As such, employment generation at the 'regional level' comprises Yorkshire and the Humber.

INCREASED DEMAND FOR ACCOMMODATION AND COMMUNITY FACILITIES DUE TO AN INFLUX OF WORKERS

5.3.5. Any workers employed at the Drax Power Station during the construction phase are likely to require access to local accommodation and use of community facilities, should they be drawn from a wider geographical area (outside of SDC). This may be due to the requirement for a specialist construction skill or activity. Given that any workers who are temporarily relocating to the local area

during construction will likely reside within the locality, the surrounding settlements within an approximately 2 km radius of the Site Boundary will be considered. In addition to this, the settlements of Selby, Goole, and Camblesforth are also considered relevant for consideration, given that these are larger settlements offer a range of local amenities including temporary accommodation, hotels, local shops, cafes, and other services.

LAND USE

5.3.6. The Study Area for land use related assessments has been defined using Design Manual for Roads and Bridges (DMRB) guidance Volume 11, Section 3, Part 6, LA112 Population and Human Health (Highways England, 2019). Despite the DMRB being the standard for assessment of road schemes, this guidance provides the best methodology for assessing Population, Health, and Socio economics in the context of the Proposed Scheme. The guidance advises a Study Area of 500 m surrounding the Proposed Scheme boundary for the land use and accessibility elements of the assessment.

- Private property and housing: Land parcels of properties and land owned by private landowners that lie within 500 m of the Site Boundary, or those which have a direct means of access within the Site Boundary.
- Public Access for Walkers, Cyclists and Horse Riders: A 500 m Study Area around the Site Boundary will be used for the assessment of change in accessibility and amenity value of routes used by walkers, cyclists, and horse riders (WCH) and PRoWs. Based on professional judgement, it is considered that this is a suitable area within which there is a likelihood of receptors to be affected by the Proposed Scheme.
- Agricultural Land Holdings: Agricultural land holdings within 500 m of the Site Boundary that would be directly affected, or those which have a direct means of access within the Site Boundary.
- Development land and businesses: Land parcels and businesses located within 500 m of the Site Boundary, or those which have a direct means of access within the Site Boundary.
- Community land and assets: Community land, community and recreational facilities located within 500 m of the Site Boundary, or those which have a direct means of access within the Site Boundary.

HEALTH

5.3.7. For the human health assessment, the Study Area has been determined by the extent and characteristics of the Proposed Scheme, and the communities directly and indirectly affected by the Proposed Scheme. The smallest jurisdiction boundaries for the Proposed Scheme are the Lower Layer Super Output Areas (LSOAs) of Selby 007C, Selby 008A, and Selby 008B. Where possible, they form the basis of the Study Area for health because they are the communities that are most likely to experience direct and / or greater impacts.

Where data is unavailable at an LSOA level, the wards of Camblesforth and Brayton will be used.

5.3.8. Datasets for larger jurisdiction boundaries have been used when data for the LSOA or ward is not available and for means of comparison against the LSOA or ward. The various area profiles are as follows:

- National: England;
- Regional: Yorkshire and the Humber;
- County: North Yorkshire;
- District: Selby;
- Ward: Camblesforth and Brayton; and
- LSOA: Selby 007C, Selby 008A, and Selby 008B.

5.4. SENSITIVE RECEPTORS / RESOURCES

5.4.1. The following sensitive receptors have been identified:

- Local economic receptors (i.e. working age individuals within the local and regional level Study Areas, local businesses who may provide services or accommodation, either through supply chain linkages or accommodation to construction employees, development land and agricultural land);
- Crime and Safety (and an individual or community's experience of this);
- Individuals who reside in private property or housing within the local area; and
- Community receptors (i.e. publicly accessible routes and PRoW used for recreation, and community land and assets).

5.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

CONSTRUCTION

5.5.1. Relevant mitigation measures will be identified in the ES, and these may include:

- Accesses to residential and commercial properties must remain open throughout the construction period;
- Mitigation measures from other environmental topics, including Landscape and Visual, Air Quality, and Noise and Vibration should be taken into account along with the provision of a Construction Environmental Management Plan (CEMP);
- The Applicant will liaise with residents and user groups prior to the commencement of construction works to ensure contractors act considerately in relation to local residents and to ensure they are aware of the programme and nature of the works, in particular, any works that may be programmed to take place at night.

- The design will ensure that routes used by WCHs, including PRoW and footways will remain open and accessible to users during construction.
- Operation

5.5.2. Health related mitigation measures are presented in Chapter 7 (Air Quality), Chapter 8 (Noise and Vibration) and Chapter 10 (Landscape and Visual) of this EIA Scoping Report.

5.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

5.6.1. There are no likely effects of moderate or major significance anticipated to arise for Population, Health and Socioeconomic receptors. Therefore, there are no Population and Health effects which should be scoped in and assessed within the ES.

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

5.6.2. The impacts scoped in or out for Population, Health and Socioeconomics are as follows:

Table 5.1 – Population, Health and Socio-Economics – Impacts Scoped in or Out of Further Assessment

Impact	Phase	Scoped In	Scoped Out	Justification
Generation of direct employment opportunities	Construction Operation	Y		The construction and operation of the Proposed Scheme is likely to generate direct employment opportunities. This is likely to result in a beneficial effect which, while temporary during construction, will provide new direct employment opportunities associated with the Proposed Scheme. As such, it is considered that there is potential for a beneficial effect to arise in relation to direct employment opportunities during construction and operation and has been scoped in for further assessment.
Generation of indirect and induced employment opportunities	Construction Operation	Y		The construction and operation of the Proposed Scheme is likely to generate indirect and induced employment opportunities. This is likely to result in a beneficial effect which, while temporary during construction, has the potential to provide a change in indirect and induced employment. As such, it is considered that there is potential for a beneficial effect to arise in relation to indirect and induced employment opportunities during construction and operation and has been scoped in for further assessment.
Increased demand for accommodation and community facilities due to an influx of workers	Construction		Y	Whilst limited elements of the construction phase will require the employment of specialist contractors, it is assumed that the majority of direct, indirect and induced employment opportunities will be made available to employees in SDC and the wider region. Given the majority of construction workers are therefore likely to reside within their current locations due to good road linkages and accessibility at a local and regional level, there is unlikely to be a significant increase in demand for educational and healthcare services, community facilities and accommodation local to the Site

Impact	Phase	Scoped In	Scoped Out	Justification
				Boundary from construction workers. Therefore, this will not be considered further for assessment.
Crime and Safety	Construction Operation		Y	It is assumed that security arrangements for the Proposed Scheme will be in line with the requirements set out the Construction (Design and Management) Regulations and appropriate levels of security (personnel / CCTV) will be appointed. In addition, it is anticipated that the Proposed Scheme will be designed to incorporate the 'Secured by Design' principles and liaison could be undertaken with the Police Architectural Liaison Officer at the detailed design stage. Appropriate levels of security (personnel / CCTV) will be implemented during the operational phase. Therefore, there is unlikely to be a significant effect in relation to crime and safety, and this will not be considered further for assessment.
Private Property and Housing	Construction		Y	There is potential for adverse effects on private property located along Carr Lane and Redhouse Lane during construction, however, these effects will be assessed in the Traffic and Transport, Noise and Vibration, Air Quality and Landscape and Visual chapters.
Changes in Access to Community Land and Assets	Construction		Y	Given that a large proportion of the Site Boundary is within the Drax Power Station, and the remaining area is predominantly agricultural, with no recreational uses beyond the PROW identified, there is unlikely to be a significant effect in relation to community land and assets, leisure uses or tourism in the local area. While it is acknowledged that the Drax Golf Club car park is bounded by the Site Boundary on all sides, the car park itself and functioning of the club will remain unaffected. As such, this will not be considered further within the assessment.

Impact	Phase	Scoped In	Scoped Out	Justification
Development Land and Businesses	Construction		Y	Access to / from local businesses will remain open during construction, and there is not anticipated to be significant disruption which would affect business operations giving rise to adverse effects.
Agricultural Land holdings	Construction Operation		Y	There is potential for adverse effects on agricultural land during construction and operation, however, these are likely to be minimal and therefore have been scoped out of further assessment.
Health	Construction Operation		Y	There is potential for direct adverse and effects on health during both construction and operation, however, any human health effects from noise and vibration or air quality will be assessed within the noise and vibration or air quality chapters.

5.7. PROPOSED ASSESSMENT METHODOLOGY

LEGISLATIVE AND POLICY FRAMEWORK

5.7.1. The following legislation, policy and guidance will be applied to the Population, Health, and Socio-economics assessment:

Directive and Legislation:

- Countryside and Rights of Way Act (Countryside and Rights of Way Act, 2000);
- Equality Act (Equality Act, 2010); and
- Localism Act (Localism Act, 2011).

National Policy:

- National Planning Policy Framework (Ministry of Housing Communities and Local Government, 2019); and
- Planning Practice Guidance 2014 (Ministry of Housing, Communities and Local Government, 2014).

Local Policy:

- Selby District Core Strategy Local Plan (Selby District Council , 2013);
- North Yorkshire's Joint Strategic Needs Assessment (North Yorkshire County Council, 2016); and
- York, North Yorkshire and East Riding Strategic Economic Plan (York, North Yorkshire and East Riding Enterprise Partnership, 2014).

Guidance:

- Homes and Community Agency (HCA) Employment Density Guide 3rd Edition (Homes and Community Agency , 2015); and
- English Partnerships (2014) Additionality Guide 4th Edition (Homes and Communities Agency , 2014).

METHODOLOGY

Generation of Direct, Indirect and Induced Employment Opportunities

5.7.2. The assessment of likely significant effects relating to employment generation during the construction and operational phases will be undertaken using Excel based analysis. All of the data sources used are publicly available.

5.7.3. Local employment generation will be assessed for the local area of Selby, and regional employment generation for Yorkshire and the Humber.

5.7.4. In addition to the direct employment generated by the Proposed Scheme, there will be an increase in employment arising from "*further economic activity (jobs, expenditure or income) associated with additional local income and local*

supplier purchases"; the indirect and induced effects of the construction activity (Homes and Communities Agency , 2014). Employment growth will arise locally through manufacturing services and suppliers to the construction process (indirect or supply linkage multipliers).

5.7.5. Additionally, part of the income of the construction workers and suppliers will be spent in the region, generating further employment (induced or income multipliers). The effects of the multiplier depend on the size of the geographical area that is being considered, the local supply linkages and income leakage from the area.

5.7.6. The English Partnerships Additionality Guidance (Homes and Communities Agency , 2014) provides a guide to the composite multipliers (the combined effect of indirect and induced multiplier effects) which should be applied. In line with this guidance, in a regional context for Yorkshire and the Humber, a multiplier of 1.5 will be applied on the basis that the level of multiplier effects is considered to be 'medium' as there are anticipated to be 'average linkages' associated with the Proposed Scheme.

5.7.7. At this stage, it is not possible to isolate the Industry Sector where the impact may occur. Therefore, these figures will be evaluated against the total number of employees in all Industry Sectors within the local and regional levels to determine the magnitude of change.

5.7.8. In addition to this assessment, a standalone Socio economic Benefits Statement will be submitted with the DCO Application. This will discuss further the generation of direct, indirect and induced employment opportunities, as well as the economic and social impacts of the Proposed Scheme.

5.8. ASSUMPTIONS AND LIMITATIONS

5.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- No statutory or non-statutory consultation in relation to Population, Health and Socio economics has been undertaken at this stage;
- The assessment would rely, in part, on data provided by third parties (e.g. OS Mapping, Local Authorities, Office for National Statistics (ONS)) which are the most up-to-date, available at the time of the assessment. No significant changes or limitations in these datasets have been identified that would affect the robustness of the assessment for EIA purposes;
- Vulnerable groups, including those with protected characteristics as defined by the Equality Act 2010 would be assumed to be present throughout the Study Area, additionally where specific areas have been identified as deprived, these areas will be emphasised;
- Population impacts would be identified in the ES down to the lowest defined population group available according to ONS survey outputs (lower super

output areas). Further granularity of data is not available. No significant changes or limitations in these datasets have been identified that would affect the robustness of the assessment for EIA purposes; and

- COVID-19 has led to unprecedented changes in working patterns, employment and travel needs, over a short period of time. There is a great deal of uncertainty as to how these changes will continue to develop over the medium and long term, particularly over the period covered by the EIA. Where relevant, this will be considered further as part of the preparation of the PEIR and ES and any assumptions that are required to ensure a robust assessment will be explained.

5.9. REFERENCES

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6. TRANSPORT

6.1. INTRODUCTION

6.1.1. This chapter considers the traffic and transport impacts of the Proposed Scheme during construction and operation, and any potential significant effects. It sets out the proposed methodology for the Traffic and Transportation assessment and identifies those impacts that are scoped in or out of the Environmental Impact Assessment (EIA).

6.2. BASELINE CONDITIONS

6.2.1. The following sources of information will be used to define the Baseline conditions on which the assessment will be based:

- Determination of the existing traffic levels and characteristics, making use of data from the recent Drax Repower Development Consent Order (DCO) application and WebTRIS traffic count data from Highways England to understand differences Covid-19 may have had on traffic levels;
- Public transport scheduling information and timetables;
- Multiple map sources including Public Rights of Way (PRoW) definitive map and cycle routes; and
- Personal Injury Collision (PIC) data for 2015-2020 (most recent years available) by analysing the latest Department for Transport (DfT) 'Road Accidents Safety Data' dataset in iGIS.

6.2.2. Drax Power Station is serviced by road via three points of vehicular access as follows:

- South Gate – a southern site access arrangement situated along the A645 comprising a priority T-junction arrangement, including a right-turn ghost island. A traffic splitter island is provided in the junction mouth of the minor arm to prevent right-turn out vehicle manoeuvres;
- North Gate – a northern site access arrangement situated along New Road comprising a priority T-junction arrangement; and
- Materials Handling Gatehouse Entrance – a northern site access arrangement situated along New Road (approximately 500m north of the North Gate) comprising a priority T-junction arrangement.

6.2.3. The A1041 and the A645 serve to connect Drax Power Station to the wider road network. The Strategic Road Network is accessed at Junction 36 of the M62 (via A645 and A614), approximately 6.0 km to the south east.

6.2.4. Drax Power Station is located where appropriate freight can be routed by rail (benefiting from its own rail hub infrastructure) or water (using the Existing Drax Jetty located along the River Ouse). The Existing Drax Jetty is not regularly

used and would require upgrading to be utilised as part of the Proposed Scheme (as explained in Chapter 2 (Site and Project Description)).

6.2.5. Drax Power Station is bounded by parcels of agricultural land. However, there are businesses and residential properties in the wider area (including, the settlements of Drax, Camblesforth and Barlow) to the south east, south west and north west respectively which have all been considered in the proposed scope of assessment.

6.2.6. It is proposed to use the traffic flows collected for the Drax Repower DCO application. Drax Repower Environmental Statement (ES) *(*ES-Volume 1-Chapter 5- Transport (APP-073)) (WSP, 2018), was prepared by WSP and included traffic surveys for all junctions and links within the Study Area. The traffic surveys were undertaken in March 2018.

6.2.7. It is anticipated that 2018 data will be the most representative available data due to the current impacts of Covid-19. However, a review of these traffic flows will be undertaken using WebTRIS to check for consistency and validity of the data. If necessary, additional traffic surveys may be commissioned during 2021 subject to agreement with the highway authorities that traffic conditions are considered representative.

6.2.8. This approach will be discussed with the relevant Highway Authorities, namely North Yorkshire County Council (NYCC), East Riding of Yorkshire (ERoY), and Highways England, through additional scoping discussions.

6.3. STUDY AREA

6.3.1. The Study Area comprises the following junctions and the connecting highway links:

- M62 Junction 36 Dumbbell Roundabout;
- A614 / Services Roundabout;
- A614 / A645 Roundabout;
- A645 / New Road Roundabout;
- A645 / A1041 Station Road Roundabout;
- A63 / A1041 Roundabout; and
- A63 / A162 Roundabout.

6.3.2. The Study Area is the same as the Drax Repower DCO application, which was agreed following detailed consultation with NYCC, ERoY and Highways England. The Study Area will be refined as further information is made available and the Proposed Scheme's traffic and transport characteristics are fully understood, including cumulative impacts and Abnormal Indivisible Loads (AILs).

6.3.3. It is proposed that any refinements to the Study Area will be primarily based upon ‘Rule 1’ and ‘Rule 2’ of the Institute of Environmental Management and

Assessment (IEMA) guidelines which can be used to determine the effect of increased traffic volumes on links within the Study Area, as described below:

- Rule 1 – Include highway links where traffic flows (or HGV flows) are predicted to increase by more than 30%; and
- Rule 2 – Include any other specifically sensitive areas where traffic flows (or HGV flows) are predicted to increase by 10% or more.

6.3.4. A desk-study will also be undertaken to identify PRoW which may need to be closed or diverted (temporarily or permanently) in order to remove any potential conflict between non-motorised users and development generated traffic. However, it is anticipated that there will be no requirement to close or divert PRoW as part of the Proposed Scheme.

6.4. SENSITIVE RECEPTORS / RESOURCES

6.4.1. The following sensitive Receptors have been identified and will be considered within the EIA:

- Motorised users of the surrounding highway network, including vehicle drivers and public transport users;
- Non-motorised users of the surrounding highway network, PRoW and non-designated public routes, including pedestrians, cyclists and equestrians (and vulnerable groups);
- Residents within the settlements of Camblesforth, Drax, Long Drax, Barlow, Barmby on the Marsh, Carlton and Hemingbrough.

6.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

6.5.1. The following Tertiary Mitigation Measures have been identified to safeguard the environment and will be considered within the EIA:

- **Construction Traffic Management Plan (CTMP)** which will provide details of procedures for construction related traffic, including: number of vehicles; routes; frequency and timing of movements; worker hours and shift patterns; laydown areas and parking; and finally, AILs;
- **Construction Worker Travel Plan (CWTP)** which focuses on minimising the traffic impacts associated with construction workers travelling to and from Drax Power Station.

6.5.2. The following Tertiary Mitigation Measure has been identified as being required if PRoW are affected:

- **Public Rights of Way Management Plan** which will describe where PRoWs would be crossed by the Proposed Scheme and how PRoWs would be managed to ensure they remain safe to use and minimise disruption to the users of the PRoW network. It is anticipated that discussions will be required with the NYCC PRoW Officer once further details of the

construction activity is known and ahead of any impacts on the PRoW Network.

6.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION PHASE

6.6.1. The likely significant effects for Traffic and Transport associated with the construction phase and therefore scoped in to our assessment are set out in Table 6.1 below.

Table 6.1 – Likely Significant Effects

Environmental Impacts	Description	Receptor
Traffic Flows	Increase in traffic flows on existing roads.	All users. Residents.
Delay	Traffic delays to non-development traffic can occur at: • Key roads passing the site where there may be additional concentrations of traffic flow. • Key junctions on the highway network near the site location.	Motorised users. Residents.
Road Safety	PIC records for the local highway will be examined for the most recently available five-year period. The impact of the proposed works is assessed in terms of its likely effect on the existing accident record and any potential increase in the number of accidents.	All users. Residents.
Intimidation and Fear	Intimidation and fear criteria are considered to be dependent on the volume of traffic, the proportion of HGVs, proximity to people and any deficiencies in protection offered which can be caused by issues such as narrow pavement widths.	Non-motorised users. Residents.
Severance	Severance can occur when there is a perceived division within a community which becomes separated by a major traffic route. The assessment of severance considers specific local conditions and, in particular,	All users. Residents.

Environmental Impacts	Description	Receptor
	the location of pedestrian routes to key local facilities including crossings.	
Pedestrian Amenity	Some developments can bring about increases in the number of vehicle and pedestrian movements which can lead to greater increases in delay to pedestrians seeking to cross the road.	Non-motorised users. Residents.

OPERATIONAL PHASE

6.6.2. The Likely Significant Effects associated with the Operational Phase will potentially relate to the same environmental impacts set out in Table 6.1above. However, it is anticipated that further assessment will demonstrate operational environmental impacts are negligible and a proportional assessment can be undertaken. Changes to traffic flows as a result of the Proposed Scheme during operation are not expected to change on the road network by more than 10%.

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

6.6.3. The impacts scoped in or out for Traffic and Transport are as follows outlined in Table 6.2.

Table 6.2 – Transport – Impacts Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Development generated construction traffic	Construction	Y		The traffic impacts of site construction works, including the requirements of AIL, will be assessed as part of the EIA. At this stage, construction traffic volume and movements are not known. Further information to establish the construction traffic trip generation and profile will be sought from the Applicant.
AILs delivery strategy	Construction	Y		Further assessment and engagement with Highway Authorities required as delivery strategy could require temporary / permanent mitigation measures.
Development generated operation traffic	Operation	Y		The traffic impacts of site operation works will be assessed as part of the EIA. At this stage, operation traffic volume and movements are not confirmed. Further information to establish the operation traffic trip generation and profile will be sought from the Applicant.

6.7. PROPOSED ASSESSMENT METHODOLOGY

6.7.1. It is proposed to use the same methodology applied for the Drax Repower DCO application, which was agreed with NYCC, ERoY and Highways England. This approach will ensure consistency in methodology and assessment criteria between the respective applications.

6.7.2. The methodology will be refined to reflect the specific characteristics of the Proposed Scheme and agreed with NYCC, ERoY, and Highways England. The following sections set out the key principles established through the Drax Repower DCO application.

POLICY, LEGISLATION, AND GUIDANCE

6.7.3. Key legislation, planning policy documents and guidance documents relevant to Traffic and Transport will be considered within the EIA, including (but not limited to):

- Legislation:
  - Highways Act (1980) (Parliament of the United Kingdom, 1980);
  - Town and Country Planning Act (1990) (Parliament of the United Kingdom, 1990)
  - New Roads and Street Works Act (1991) (Department for Transport, 1991);
  - Traffic Management Act (2004) (Department for Transport, 2004);
  - Planning Act (2008) (Parliament of the United Kingdom, 2008);
  - Local Transport Act (2008) (Parliament of the United Kingdom, 2008); and
  - Infrastructure Planning (Environmental Impact Assessment) Regulations (2017) (Secretary of State, 2017).
- Key planning policy:
  - National Policy Statement EN-1 (Department for Energy and Climate Change, 2011);
  - National Planning Policy Framework (Department for Communities and Local Government, 2019);
  - Selby District Core Strategy Local Plan (Selby District Council, 2013);
  - Selby District Local Plan (Selby District Council, 2005);
  - North Yorkshire Local Transport Plan (North Yorkshire County Council, 2016);
  - East Riding of Yorkshire Local Transport Plan (East Riding of Yorkshire Council, 2015); and
  - Highways England Water Preferred Policy (Highways England, 2019).

- Key guidance documents:
  - Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993);
  - Planning Practice Guidance Travel Plans, Transport Assessments and Statements (Ministry of Housing, Communities & Local Government , 2014);
  - Planning for the Future (Highways England, 2015);
  - Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development (Department for Transport , 2013);
  - LA 101 Introduction to environmental assessment (Highways England, 2019);
  - LA 103 - Scoping projects for environmental assessment (Highways England, 2020);
  - LA 104 - Environmental assessment and monitoring (Highways England, 2019); and
  - LA 112 Population and Human Health, Design Manual for Roads and Bridges (Highways England, 2020).

6.7.4. The traffic and transport assessment will also draw on previously completed technical assessments prepared as part of the Drax Repower DCO application including the following:

- 6.1.5 Chapter 5 (Transport) of the Environmental Statement (Volume 1) (APP-073)) (WSP, 2018),
- 6.2.5.1 Appendix 5.1 (Outline Construction Worker Travel Plan) of the Environmental Statement (Volume 2) (REP4-013) (WSP, 2018);
- 6.2.5.1 Appendix 5.2 (Construction Traffic Management Plan) of the Environmental Statement (Volume 2) (REP4-014) (WSP, 2018); and
- 8.4.6 Outline Public Rights of Way Management Plan (REP7-013) (WSP, 2019).

PROPOSED SCHEME (CONSTRUCTION PHASE)

6.7.5. It is anticipated that construction will commence in 2024 and last for approximately 39 months, as shown in Table 6.3 below.

Table 6.3 - Anticipated Construction Works Programme

	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mobilisation and soil removal																
Earthworks																
Civil works																
Installation																
Commissioning																

PROPOSED SCHEME (OPERATIONAL PHASE)

6.7.6. Following completion of construction, it is anticipated that operation of 'Unit 2' will commence in 2027 and the operation of 'Unit 1' will commence in 2028.

6.7.7. It is expected that staffing levels on the Drax Power Station will be less than existing levels as a result of the two remaining coal powered units ceasing operation in March 2021.

COMMITTED DEVELOPMENT

6.7.8. The following anticipated construction duration programmes for other proposed projects at the Drax Power Station are summarised below:

- Drax Repower DCO application: 2020 – 2027 – Peak Construction Years 2022 and 2026
- Drax Flue Gas Desulphurisation (FGD) Demolition: 2021 – 2027. – Flat construction trip profile assumed (Planning Reference 2020/0994/FULM)

6.7.9. There are potential cumulative impacts associated with proposed projects at the Drax Power Station from 2024 onwards. Therefore, it is expected that an assessment of the significance of the Cumulative Effects will be undertaken in the context of the potential interactions associated with the Proposed Scheme.

6.7.10. It is proposed, based on the information available at present, that the assessment years are based on the Drax Repower peak construction year of 2026, where there is overlap with the Proposed Scheme. In addition, until such time it can be scoped out it is proposed to assess the Operational Phase in 2028.

6.7.11. It is also requested that NYCC, ERoY, and Highways England provide a list of 'reasonably foreseeable' committed developments for further review as part of the cumulative impacts of the Proposed Scheme.

ASSESSMENT SCENARIOS

6.7.12. The following assessment scenarios are proposed and will be discussed further with the relevant highway authorities through additional scoping discussions:

- **2018 Existing** – this is the 2018 surveyed traffic flows collected during 2018 as part of the Drax Repower DCO application;
- **2021 Baseline** - this is the 2018 surveyed traffic flows and traffic growth applied, or subject to representative traffic conditions 2021 surveyed traffic flows;
- **2021 Do Minimum** - this is the 2021 Baseline plus 'reasonably foreseeable' committed development;
- **2026 Future Baseline** - this is the 2021 Baseline with traffic growth applied;
- **2026 Do Minimum** – this is the 2026 Baseline plus 'reasonably foreseeable' committed development (Without Development);

- **2026 Do Something** – this is the 2026 Do Minimum plus construction traffic (With Development – Construction Phase);
- **2028 Future Baseline** - this is the 2026 Baseline with traffic growth applied;
- **2028 Do Minimum** - this is the 2026 Do Minimum with traffic growth applied plus 'reasonably foreseeable' committed development (Without Development); and
- **2028 Do Something** - this is the 2028 Do Minimum plus operational phase traffic associated with Units 1 and 2 (With Development – Operational Phase).

6.7.13. It is anticipated that full assessment of the Operational Phase will not be required (2028 Future Baseline/Do Minimum/Do Something), as we expect further information to indicate a negligible impact. It is acknowledged that this will need to be agreed with the highway authorities through subsequent scoping discussions when additional information and clarity on Operational Phase staffing levels can be provided.

SIGNIFICANCE OF EFFECT CRITERIA

6.7.14. The traffic generated by all aspects of the Proposed Scheme will be used to assess the impacts on the key links and junctions on the surrounding network. The likely effects of the Proposed Scheme in environmental terms will be evaluated in accordance with the 'Guidelines for the Environmental Assessment of Road Traffic' (Institute of Environmental Assessment, 1993). The transport related environmental effects (as defined by IEA guidelines) include the following environmental impacts:

- Traffic flows;
- Delay;
- Road safety;
- Fear and intimidation;
- Severance; and
- Pedestrian amenity.

6.7.15. The significance of effects criteria will be based on the magnitude of change associated with the Proposed Scheme and the sensitivity of the affected receptor and is set out in Chapter 3 (EIA Methodology). The magnitude of change will be assessed on a scale of high, medium and low, and negligible. The sensitivity of the affected receptor will be assessed on a scale of high, medium and low, and negligible. The Traffic and Transport effects will be aligned with the significance of effect matrix criteria included in Chapter 3 (EIA Methodology).

6.7.16. For many receptors, there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and the application of professional judgement on the part of the assessor, backed-

up by data or quantified information wherever possible. Consultation with stakeholders can determine the sensitivity of each Receptor. The specific impact Magnitude and significance criteria of each Receptor will be agreed with the highway authorities, taking into account locally specific issues, as was undertaken for the Drax Repower DCO application.

TRAFFIC AND TRANSPORT ASSESSMENTS

6.7.17. It is anticipated that the following documents will be produced as part of the EIA:

- Environmental Statement - Traffic and Transport Chapter incorporating a Transport Assessment;
- Outline Construction Traffic Management Plan; and
- Outline Construction Workers Travel Plan.

6.7.18. Further scoping discussions will be required with the relevant planning and highway authorities to agree the detailed assumptions underpinning the assessment of traffic and transport environmental impacts.

6.7.19. Statements of common ground will be prepared in relation to the traffic and transport impacts with the relevant authorities and organisations.

6.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

6.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- This EIA Scoping chapter has been prepared during the COVID-19 pandemic which has dramatically changed travel patterns in the short-term and potentially medium- longer term. Government policy of 'tiered restrictions' has led to temporary changes in travel demand and, as a result, consultants and Local Authorities are unable to undertake representative traffic surveys to measure 'typical' traffic conditions to assess the impact of development proposals. It is proposed to use traffic surveys collected during 2018 as part of the Drax Repower DCO application and this will be discussed with the Highway Authorities.
- There are currently two options proposed to deliver AILs to the Site which could require temporary / permanent Mitigation Measures, as described below (and in Chapter 2 (Site and Project Description):
  - **Option one:** AILs will be delivered to the Port of Goole and transferred by road via the Goole Bypass, across the M62 and then the A645 to Drax Power Station. This method would require the temporary removal of street furniture, lifting or temporary removal of overhead lines, and overnight road closures; or
  - **Option two:** AILs will be delivered to the Upgraded Drax Jetty and transferred by road via Redhouse Lane to Drax Power Station. It is anticipated that highway improvements to Redhouse Lane and Carr

Lane between the Upgraded Drax Jetty and Drax Power Station will be required to facilitate the movement of AILs. In addition to this, permanent or temporary use of agricultural land adjacent to the road may be required, the temporary removal of street furniture, and lifting or temporary removal of overhead lines, and overnight road closures.

6.8.2. The two options will be subject to a 'reasonableness' test in accordance with the Water Preferred Policy – Guidelines for the movement of abnormal indivisible loads (Highways England, 2019), which will assess whether movement by water is economically viable. Identification of the preferred option will be based upon the outcome of this test and then the preferred option will undergo a more detailed environmental assessment. The movement of AIL will form part of the additional scoping discussions with NYCC, ERoY, and Highways England. It is anticipated the preferred option will have been identified before the ES is finalised, and the EIA is therefore expected to only assess that option.

- The 'Construction Phasing' and associated construction worker profile will be developed with the Applicant and the relevant contractors. This will feed into discussions regarding assessment scenarios and will be shared with the highway authorities.
- The assessment assumes that additional staff, deliveries or trips to Drax Power Station will be negligible during the Operational Phase of the Proposed Scheme and thus deemed insignificant in terms of Traffic and Transport. It is anticipated any assessment of the operational impacts will be proportionate to the change in operational staff levels and maintenance requirements. The level of assessment will be agreed with the highway authorities through further consultation.

6.9. REFERENCES

- Department for Communities and Local Government. (2019). National Planning Policy Framework.
- Department for Energy and Climate Change. (2011). National Policy Statement EN-1.
- Department for Transport . (2013). Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development.
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- Highways England. (2019). Water preferred policy - Guidelines for the movement of abnormal indivisible loads.
- Highways England. (2020). LA 103 - Scoping projects for environmental assessment.
- Highways England. (2020). LA 112 Population and Human Health, Design Manual for Roads and Bridges.
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- Secretary of State. (2017). Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- Selby District Council. (2005). Selby District Local Plan.
- Selby District Council. (2013). Selby District Core Strategy Local Plan.
- WSP. (2018). Drax Repower ES, 6.1.5 Environmental Statement-Volume 1-Chapter 5- Transport. Drax.
- WSP. (2018). Drax Repower ES, 6.2.5.1 Environmental Statement-Volume 2-Appendix 5.1- Outline Construction Worker Travel Plan.
- WSP. (2018). Drax Repower ES, 6.2.5.2 Environmental Statement-Volume 2-Appendix 5.2- Outline Traffic Management Plan.
- WSP. (2019). Drax Repower, 8.4.6 Outline Public Rights of Way Management Plan.

7. AIR QUALITY

7.1. INTRDUCTION

7.1.1. This chapter considers the impacts of the Proposed Scheme on air quality during construction and operation, and any potential significant effects. It sets out the proposed methodology for the historic environment assessment and identifies those impacts that can be scoped out of the EIA.

7.2. BASELINE CONDITIONS

7.2.1. The key sources of information on baseline air quality conditions will be:

- National pollutant concentration mapping for nitrogen oxides and particulate matter, available from Department for Environment, Food and Rural Affairs (Defra) website (Department for Environment Food and Rural Affairs, 2020);
- National pollutant concentration for ammonia and sulphur dioxide, and deposition mapping for nitrogen and acid, available from Air Pollution Information Service (APIS) (UK Centre for Ecology & Hydrology, 2020);
- WSP in-house data holdings of diffusion tube monitoring from ecological sites;
- Local Air Quality Management monitoring and reporting from Local Authorities including Selby District Council, Doncaster District Council, North Lincolnshire District Council and Wakefield District Council;
- UK's national monitoring networks, managed by the Environment Agency (EA) on behalf of Defra and the Devolved Administrations, with data available from Defra's website (Defra, 2020); and
- Peer reviewed literature.

7.2.2. At this stage, no additional, project-specific, air quality surveys are proposed.

7.2.3. The Proposed Scheme is located in a largely rural area, surrounded by agricultural land with a relatively sparse population in villages and isolated properties. The nearest population centres are Selby, approximately 6 km to the north-west and Goole, approximately 8 km to the south-east.

7.2.4. Air quality in the area is mainly influenced by emissions from the Drax Power Station site and Ferrybridge waste to energy plant, emissions from traffic on the local road network including the M62 motorway, and agricultural practices. The coal-fired units at Drax Power Station will not form part of the future baseline scenario. The Eggborough coal-fired power plant was decommissioned in 2018 but development consent has been granted for a new combined cycle gas turbine power plant (Eggborough CCGT), emissions from which will form part of the future baseline.

7.2.5. Ambient pollutant concentrations in the immediate vicinity of the Proposed Scheme are well within the UK's statutory air quality standards for the protection

of human health. There are Air Quality Management Areas (AQMA) in the centre of Selby Town (~6 km, north-west) and towards Knottingley on the M62 (~14 km, south-west), both of which are associated with emissions from traffic.

7.2.6. In relation to standards for the protection of ecology, ambient concentrations of nitrogen oxides and sulphur dioxide are within the statutory standards, but ammonia concentrations exceed the non-statutory critical levels for the most sensitive plants, and nitrogen and acid deposition exceed the critical loads over some of the sensitive habitats in the area.

7.3. STUDY AREA

7.3.1. The overall operational phase Study Area for air quality extends 15 km in all directions from the Proposed Scheme. The Study Area may be refined during the assessment process as additional modelling is undertaken and applies, specifically, to operational impacts.

7.3.2. For the assessment of impacts during construction, the Study Area will be limited to the zone within 350 m of the Site Boundary or 50m of routes used by construction vehicles up to 500m from the site entrance. This conforms to the guidance of the Institute for Air Quality Management (IAQM) on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2014). It is also conservative in that it assumes that construction works could occur anywhere within the Site Boundary.

7.4. SENSITIVE RECEPTORS / RESOURCES

7.4.1. Whilst the operational Study Area is largely under agricultural use, sensitive human receptors are ubiquitous and the assessment of operational impacts will assume that the potential for exposure to impacts, at human receptors of high sensitivity, exists throughout the area.

7.4.2. As such, and given the scale of the Study Area, it is not possible or necessary to list all potential human receptors for air quality impacts. However, in the vicinity of the Proposed Scheme, key human receptors include Wren Hall, Old Lodge, Drax Abbey Farm, Foreman's Cottage and Grand Cottages, The Hayloft, Drax Sports and Social Club, and properties on Pear Tree Avenue and in Long Drax.

7.4.3. These receptors may be impacted during construction but will be largely unaffected by operational impacts. This is because, given the height of the main stack at the Drax Power Station site to be used during future operations with the Proposed Scheme (259 m), the emitted pollutants will not mix down to ground level in the immediate vicinity of the Proposed Scheme and impacts will be negligible. Rather, maximum ground level impacts will occur at distances over 10 km from the Proposed Scheme.

7.4.4. The following sensitive ecological receptors have been identified:

- River Derwent SAC and SSSI;
- Lower Derwent Valley SPA, Ramsar and NNR;
- Thorne and Hatfield Moors SAC, SPA and SSSI;
- Skipwith Common SAC, NNR;
- Humber Estuary SAC, SPA, SSSI and Ramsar;
- Barn Hill Meadows SSSI;
- Eskamhorn Meadows SSSI; and
- Barlow Common LNR.

7.4.5. These receptors are shown in Figure 2.1 (Environmental Constraints Plan) and may change as the Study Area is refined. Further details on the ecological receptors are provided in Chapter 9 (Ecology).

7.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

7.5.1. During construction, mitigation measures will be employed to ensure that emissions of dust and particulate matter are minimised during works. At this stage, given the nature of surrounding land use, it is envisaged that best practice measures for dust control at medium risk sites, as set out in IAQM guidance, will suffice and that bespoke measures or extensive monitoring will not be required.

7.5.2. During operation, the principal design mitigation measure is the use of the 259m Main Stack on the Drax Power Station site for the discharge of emissions. Existing pollution control measures, ensuring that emissions meet limits set out in the Industrial Emissions Directive, will continue to operate alongside the Proposed Scheme. Alternative designs for the Proposed Scheme, using one or more new stacks rather than the existing Main Stack, have undergone initial screening of impacts and are not being pursued further.

7.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

7.6.1. The impacts scoped in or out for Air Quality are as follows:

Table 7.1 – Air Quality – Impacts Scoped In or Out of Further Assessment

Impacts	Phase	Scoped In	Scoped Out	Justification
Emissions of dust and particulate matter from construction works	Construction	Y		Works have potential to generate dust and there are potential receptors for impacts in the vicinity of the Proposed Scheme.
Emissions of nitrogen oxides (NO_X) and PM_{10} from construction vehicles leaving and accessing the Proposed Scheme and construction plant	Construction		Y	At present, detailed construction traffic volume and movements are not known. However, as an annual average, fewer than 100 HDV will be generated on a daily basis and, taking into account baseline air quality, there is no realistic potential for significant effects from vehicles. Furthermore, given the distance of receptors from the Site Boundary and the nature of works, there is no realistic potential for significant effects from the Proposed Scheme. Appropriate control measures will be included within the Register of Commitments for inclusion in the CEMP, but formal assessment of impacts is not warranted.
Emissions of air quality strategy pollutants from operation of Proposed Scheme (NO_X, SO_2, $PM_{10/2.5}$)	Operation	Y		The Drax Power Station will continue to be a major emitter of pollutants and impacts require assessment in relation to both human health and, if relevant, ecological receptors.
Emissions of other pollutants from operation of Proposed Scheme (NH_3, HCl,	Operation	Y		The Drax Power Station will continue to be a major emitter of pollutants and the Proposed Scheme will introduce emissions of new pollutants (amines) that

Impacts	Phase	Scoped In	Scoped Out	Justification
amines) and deposition of pollutants				have the potential to affect both human and ecological health, and deposit to surfaces.
Emissions of nitrogen oxides (NO_X) and PM_{10} from operational vehicles leaving and accessing the Proposed Scheme	Operation		Y	Changes to operational traffic volumes will not trigger IAQM criteria for assessment of impacts (ie, outside AQMA, 500 vehicles per day or 100 HGV per day). There is, therefore, no potential for significant effects.

7.7. PROPOSED ASSESSMENT METHODOLOGY

7.7.1. The approach to the assessment of the Proposed Scheme will be discussed and agreement sought with SDC and the EA. Based on the likely environment effects set out above, the scope of the assessment will include the following:

- Qualitative assessment of dust and emissions from construction works; and
- Quantitative assessment of emissions to air from the operation of the Proposed Scheme.

7.7.2. The assessment of construction impacts will be undertaken in line with IAQM guidance. This guidance provides a risk-based approach to the assessment of the potential for dust effects from four types of activities: demolition, earthworks, construction and track-out (the movement of dust/mud offsite on construction vehicles), taking into account the sensitivity of the environment surrounding the works. The IAQM guidance recommends that the significance of effects is only assessed after mitigation (in this case, the primary mitigation) is taken into account, and furthermore states that, in the majority of circumstances, no significant effects are likely. The main purpose of the assessment of dust risk is to ensure that the proposed mitigation is appropriate for the Proposed Scheme.

7.7.3. The air quality assessment for the operational phase will utilise atmospheric dispersion modelling software – ADMS version 5.2 – published by Cambridge Environmental Research Consultants (CERC). The air dispersion model will consider the effects of terrain, roughness length changes and buildings (as appropriate for the location), together with, in accordance with EA guidance, 5 years of recent meteorological data from RAF Waddington. The use of this station is consistent with previous assessments of the Power Station, including the Drax Repower ES - Volume 1 - Chapter 6 Air Quality (APP-074) (WSP, 2019).

7.7.4. For the assessment of amines, the ADMS Amine Chemistry Module (Cambridge Environmental Research Consultants Ltd, 2016) will be used to model the chemical reactions associated with the formation of nitrosamines and nitramines. Reactivity rates for amines potentially being used for the Proposed Scheme will be provided by the suppliers.

7.7.5. Since emissions will be discharged through the existing stack on the Drax Power Station site, no stack height sensitivity testing is required.

7.7.6. A worst-case operation profile will be developed based on the Proposed Scheme and the overall assessment of operational impacts will be undertaken in line with the following guidance:

- EA Guidance of Air Emissions Risk Assessment (Environment Agency, 2020);
- Defra's LAQM TG(16) guidance (2016) (Defra, 2018); and

- IAQM/EPUK Guidance on Planning for Air Quality (2017) (Environmental Protection UK & Institute of Air Quality Management, 2017).

7.7.7. Emissions from the Proposed Scheme will be taken, where available, from the limits set in the Industrial Emissions Directive (IED). For pollutants not included in the IED, emissions will be provided by equipment suppliers.

7.7.8. The assessment of the deposition of nitrogen and acid will follow EA guidance (AQTAG (06)). Deposition velocities for pollutants not included within this guidance will be derived from literature and agreed with EA. The assessment of acid deposition will utilise the critical load function tool available on the APIS website2.

7.7.9. Background pollution and deposition levels will be taken from the national mapping provided by Defra and APIS for human and ecological receptors respectively.

7.7.10. The quantified impacts will be assessed in relation to the following standards:

- Statutory ambient air quality standards for both human and ecological receptors;
- Non-statutory critical levels and critical loads for ecological receptors, taken from APIS website; and
- Non-statutory environmental assessment levels (EALs) set by the EA.

7.7.11. Where none of the above are available for a pollutant, a literature search will be used to derive a robust and appropriate assessment standard.

7.7.12. Impacts at individual receptors will be described using the matrix set out in IAQM/EPUK guidance which describes impacts as negligible, slight, moderate or substantial adverse/beneficial as appropriate. The guidance provides a framework, but no specific criteria, to inform the assessment of the significance of effects using professional judgement.

7.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

7.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment will be based on dispersion modelling which has inherent uncertainties, both within its input data and the formulation of complex atmospheric processes. However, for a proposed project, modelling is the most appropriate method of determination of impacts against short term (15 minute / hourly / 8 hourly / daily means) and annual mean criteria. The model results should, however, be used as a guide only.
- Emissions data for amines will be provided by equipment suppliers on the basis of field and laboratory testing. No Proposed Scheme specific emissions data will be available. If necessary, the assessment will be based

on worst case assumptions regarding the detailed composition of the amines released to air.

7.9. REFERENCES

- Cambridge Environmental Research Consultants Ltd. (2016, November). ADMS Amine Chemistry Module, v5.2, User Guide Supplement. Cambridge: CERC.
- Defra. (2018). Local Air Quality Management Technical Guidance (TG16). London: Defra.
- Defra. (2020). Monitoring Networks. Retrieved from UK Air Information Resource: https://uk-air.defra.gov.uk/networks/
- Department for Environment Food and Rural Affairs. (2020). Background Air Pollutant Maps. Retrieved from Defra Local Air Quality Management: https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html
- Environment Agency. (2020, October). Air emissions risk assessment for your environmental permit. Retrieved from Environmental Permits: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit
- Environmental Protection UK & Institute of Air Quality Management. (2017). Land-Use Planning & Development Control: Planning for Air Quality. London: EPUK & IAQM.
- Institute of Air Quality Management. (2014). Guidance on the assessment of dust from demolition and construction v1.1. London: IAQM.
- UK Centre for Ecology & Hydrology. (2020). Air Pollution Information System. Retrieved from http://www.apis.ac.uk/srcl
- WSP. (2019). Drax Repower ES - Volume 1 - Chapter 6 - Air Quality (APP-074).

8. NOISE AND VIBRATION

8.1. INTRODUCTION

8.1.1. This chapter considers the impacts of the Proposed Scheme on Noise and Vibration during construction and operation and any potential significant effects. It sets out the proposed methodology for the Noise and Vibration assessment and identifies those impacts that can be scoped out of the EIA.

8.2. BASELINE CONDITIONS

8.2.1. Baseline information gathered during White Rose Carbon Capture and Storage Project DCO application and Drax Repower DCO application has been reviewed to inform this chapter given the location of those projects in relation to the Site Boundary. In particular, the baseline conditions presented in the Drax Repower ES (Document reference: 6.1.7-Environmental Statement-Chapter7 Noise and Vibration) have been revisited.

8.2.2. The baseline noise information currently available corresponds to noise monitoring carried out in 2013 and 2017 at locations that had the potential to be affected by the construction and operation of the White Rose Carbon Capture and Storage Project and Drax Repower. Table 8-1shows the background noise levels, L_{A90} dB, for key receptors surrounding the Site Boundary.

Table 8.1 – Baseline Noise Information Available

Measurement Location	$L_{A90,T}$ dB
1-Wren Hall (2013)	35
2-Old Lodge (2013)	32
3-Drax Abbey (2013)	35
4-Foreman's Cottage (2013)	35
5-Barlow (2013)	35
6-Camblesforth (2013)	43
7-Station Cottage, Hales Lane (2017)	49
8-Briden Bungalow, Main Road (2017)	43

8.2.5. The local noise environment is dominated by noise from the Drax Power Station, traffic using the wider road network and farming machinery.

8.2.6. There is one Noise Important Area (NIA) approximately 1.3 km from the Site Boundary including dwellings adjacent to the A1041.

8.3. STUDY AREA

8.3.1. The Study Area proposed in the operational noise and vibration assessment is a 2 km radius from the Site Boundary. It is anticipated that noise and vibration as a result of the Proposed Scheme would be not significant beyond this point.

8.3.2. The Study Area for the construction noise and vibration assessment will be limited to a 500m radius from the Site Boundary.

8.4. SENSITIVE RECEPTORS / RESOURCES

8.4.1. The following sensitive receptors have been identified and will be considered within the environmental impact assessment:

- Dwellings;
- Hospitals, schools, nurseries, elderly homes, places of worship, Public Right of Ways, heritage assets; and
- Locations representative of biodiversity receptors including those in the River Ouse and River Derwent. Ecological surveys will be undertaken and the outcome of these will inform the location of other receptors that should be considered in the noise and vibration assessment.

8.4.2. Table 8-2 shows an initial list of receptors identified from Drax Repower. Consideration will be given to other receptors once more information on the Proposed Scheme becomes available. Distances are taken from the closest point in the Site Boundary. It is noted that this does not necessarily represent the distance to noisy activities.

Table 8.2 – Initial List of Sensitive Receptors

Receptor	Approximate Distance to Site (m)
Wren Hall	200
Long Drax	300
Old Lodge	250
Drax Abbey Farm	Less than 100
Foreman's Cottage	Less than 100
Barlow	1150
Camblesforth	730
Station Cottage, Hales Lane	Less than 100
Briden Bungalow, Main Road	500
Willow Row Drain	1300

8.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

8.5.1. Some of the opportunities for mitigation during the construction phase of the Proposed Scheme are likely to include Best Practicable Means, examples of such measures are presented below:

- Prior consent agreement for any works outside core hours, where there is potential for significant adverse effects;
- Contact details for nominated site contact for local residents to deal with complaints and engaging with local residents;
- Selection of quiet and low noise equipment and methodologies;
- Optimal location of acoustic screening to minimise noise adverse effects;
- Optimal location of equipment on site to minimise noise disturbance;
- The provision of acoustic enclosures around static plant, where necessary; and
- Use of less intrusive alarms, such as broadband vehicle reversing warnings.

8.5.2. Some of the opportunities for mitigation during the operational phase of the Proposed Scheme are likely to include:

- Selection of alternative components of Carbon Capture Plant likely to contribute to significant noise adverse effects;
- Acoustic enclosures or silencers for components of Carbon Capture Plant likely to contribute to significant noise adverse effects;
- Acoustic screening in the form of noise barrier or earth-bund, where the line of sight between source and noise sensitive receptor can be broken;
- If feasible, appropriate seasonal scheduling to minimise potential significant effects on biodiversity receptors; and
- Alternative route or limited timings for transportation of material.

8.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION PHASE

8.6.1. The likely significant effects associated with the construction phase will potentially relate to:

- Noise and vibration from the construction activities associated with the Upgraded Drax Jetty;
- Noise and vibration from the construction activities associated with the proposed modifications to Carr Lane and Redhouse Lane;
- Noise from construction traffic using the surrounding road network including noise arising from movements of Abnormal Indivisible Loads via river; and

- Noise and vibration from the construction activities associated with the installation of the post combustion carbon capture technology at up to two of the 660 MWe biomass power generating units at the Drax Power Station.

8.6.2. It is anticipated that any potential noise and vibration effects arising from the construction phase of the Proposed Scheme will be of a temporary nature for the duration of the construction phase.

OPERATIONAL PHASE

8.6.3. The likely significant effects associated with the operation phase will potentially relate to:

- Noise associated with the operation of the post combustion carbon capture technology at up to two of the 660 MWe biomass power generating units at the Drax Power Station. Plant associated with the compression of the carbon dioxide stream is expected to be the main noise of source during the operational phase of the Proposed Scheme.

8.6.4. It is anticipated that any potential noise and vibration effects arising from the operational phase of the Proposed Scheme will be of long-term nature until decommissioning.

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

8.6.5. The Impacts scoped in or out for noise and vibration are as follows:

Table 8.3 – Noise and Vibration – Impacts Scoped in or Out of Further Assessment

Impacts	Phase	Scoped In	Scoped Out	Justification
Noise and vibration impacts arising from the construction of the Proposed Scheme	Construction	Y		Construction traffic and activities for the Proposed Scheme including the Upgraded Drax Jetty have the potential to adversely affect nearby noise and vibration sensitive receptors.
Development generated vibration	Operation		Y	There are no sensitive receptors closer than 50 m from any proposed potential sources of vibration. Therefore, the industrial activities associated with the operational development are not expected to generate significant vibration levels.
Noise and vibration impacts arising from the operation of the Proposed Scheme	Operation	Y		The operation of the Proposed Scheme has the potential to adversely affect nearby noise sensitive receptors. For biodiversity receptors, the likely absolute and change in noise levels will be reported. The assessment of effects for these receptors will be presented in the Chapter 9 (Ecology).
Transportation related noise and vibration impacts	Operation		Y	Changes to transport as a result of the Proposed Scheme during operation are not expected to change traffic flows on the road network by more than 10%, therefore, not significant for noise and vibration.

Impacts	Phase	Scoped In	Scoped Out	Justification
arising from the operation of the Proposed Scheme				

8.7. PROPOSED ASSESSMENT METHODOLOGY

8.7.1. The Environmental Health team at Selby District Council will be consulted to discuss and agreement sought on the baseline noise survey methodology. Details of the purpose, location and duration of the measurements will be sought to be agreed prior to undertaking the baseline study.

8.7.2. It is anticipated that continuous noise monitoring will be carried for a period of up to one week at representative locations for the noise sensitive receptors shown in Table 8-1. Attended short-term noise measurement will be also taken at key sensitive receptors including both human and biodiversity receptors. The baseline noise survey will be undertaken in accordance with BS7445: 2003 (Bristish Standard Institute, 2003) and it will include logging of weather conditions to remove potential periods of heavy rain or high wind speeds.

8.7.3. A desktop assessment will be undertaken early in the EIA process to determine the potential adverse effects on humans and biodiversity receptors caused by the construction phase of the Upgraded Drax Jetty. Constraints will be determined in conjunction with the Proposed Scheme's ecologist and further assessment will be recommended based on the outcome of this exercise. Additional monitoring of underwater noise will be undertaken if needed to support the assessment. The methodology will be discussed and agreed with North Yorkshire County Council and Natural England.

8.7.4. A quantitative assessment will be undertaken of potential construction noise and vibration impacts following the guidance set out in BS5228-1 and 2:2009+A1:2014 – Code of Practice of noise and vibration control on construction and open sites (British Standards Institute, 2009).

8.7.5. A 3D computer noise model built using CadnaA software and ArcGIS will be used to determine the predicted construction noise levels associated with the Proposed Scheme. Modelling scenarios will be prepared with a typical configuration of plant items for key stages of the construction phase.

8.7.6. A noise model will be also prepared to determine any likely noise impacts arising from the operation of the Proposed Scheme. The model will include the information from the design process including geo-referenced plant items, heights and sound power levels. The noise propagation will be calculated in line with ISO9613 Part 2 and assessed against guidance in BS4142:2014+A1:2019 (International Organisation for Standardization, 1996) (British Standards Institute, 2014).

8.7.7. The outcome of the noise model will be used to inform the Proposed Scheme's ecologist on the magnitude of noise levels predicted at the biodiversity receptors. Assessment for these receptors will be presented in the Ecology Chapter.

8.7.8. Where necessary, the assessment will outline noise and vibration mitigation measures. The noise model will be used to quantify the acoustic benefits of these measures.

8.7.9. Significance criteria will be prepared based on the likely Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL), as defined in the Noise Policy Statement for England (NPSE) (Defra, 2010). The significance criteria for both construction and operational phases will be discussed and agreement sought with Selby District Council. We anticipate that, in line with our previous discussions with the Environmental Health Officer at Selby District Council, guidance in BS4142:2014+A1:2019 would be used as the basis for the criteria (British Standards Institute, 2014).

8.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

8.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- Baseline conditions and identification of receptors should be considered indicative. Further assessment will be undertaken to identify all receptors within the Study Area and to establish the existing noise climate;
- Noise surveys are proposed on the basis that the noise climate during early stages of the EIA process will be representative of the typical baseline conditions. Should any events, such as COVID-19 restrictions, indicate that a baseline noise survey has the potential to capture conditions that are not typical, then an alternative approach will be discussed, and agreement sought with Selby District Council;
- Scope for the assessment related to the Upgraded Drax Jetty is reliant on the outcome of the desktop assessment for this element and agreement with Proposed Scheme's ecologist and relevant stakeholders; and
- There is no design information available at the time of preparing this EIA Scoping Report, therefore, location and scale of Carbon Capture Plant and opportunities for mitigation, where required, will be assessed once this data becomes available. The assessment presented in the PEIR and ES will include the latest design information available at the time of our submission. Where design information is not available, worst case assumptions will be made.

8.9. REFERENCES

- BS 7445 (2003): Description and Measurement of Environmental Noise
- BS 4142 (2014) + A1 (2019): Methods for rating and assessing industrial and commercial sound
- BS 5228, Parts 1&2 (2009) + A1 (2014): Noise and Vibration Control on Construction and Open Sites

- ISO 9613 (1996): Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation
- Noise Policy Statement for England (2010), Defra

9. ECOLOGY

9.1. INTRODUCTION

9.1.1. This chapter considers the impacts of the Proposed Scheme on sensitive ecological receptors during construction and operation, and any potential significant effects. It sets out the proposed methodology for the ecological assessment and identifies those impacts that can be scoped out of the EIA.

9.2. BASELINE CONDITIONS

9.2.1. Existing information on likely baseline conditions was available for two previous projects that share a partial boundary with the Proposed Scheme:

- Flue Gas Desulphurisation (FGD) Planning Application, with a Town and Country Planning Act application submitted to Selby District Council (SDC) in September 2020 (WSP, 2020); and
- The Drax Repower, which was granted a Development Consent Order (DCO) by the Secretary of State (SoS) in October 2019 (WSP, 2018).

9.2.2. The ecological assessments from the FGD Planning Application and Drax Repower have been used to inform this chapter of the EIA Scoping Report (WSP, 2020; and WSP, 2018, respectively). Aerial mapping and publicly available data sources[2] were also used to identify and update relevant pre-existing ecological records. This included using the Multi-Agency Geographic Information for the Countryside (MAGIC) web portal to identify statutory designated nature conservation sites. The MAGIC portal was also used to confirm areas included on the Ancient Woodland inventory and Priority Habitat Inventory.

9.2.3. The land within the Site Boundary contains a range of habitats, including: arable farmland and grassland; hedgerows and treelines; areas of scrub; standing water (ponds); areas of semi-natural and plantation woodland; and the bankside and in-channel habitats of the River Ouse and minor streams/drainage ditches. Much of the land within the Drax Power Station site is dominated by areas of hard standing, existing buildings and other power station infrastructure, although some limited areas of semi-natural and farmland habitats also occur.

9.2.4. Initial wintering bird surveys associated with the Existing Drax Jetty have identified use of habitats (fields close to Redhouse Lane) within the Zone of Influence (ZoI) by lapwing (*Vanellus vanellus*). Marsh harrier (*Circus aeruginosus*) were also recorded along the River Ouse on two occasions during these surveys. A previous survey undertaken as part of the Drax Repower ES

[2] www.magic.gov.uk; www.jncc.defra.gov.uk;

(WSP, 2018) has confirmed the presence of otter using the River Ouse, including at the site of the Existing Drax Jetty.

9.2.5. Great crested newt (*Triturus cristatus*) have also been recorded to the north of the Drax Power Station within the Site Boundary. These were recorded during surveys for the FGD Planning Application in June 2020 (WSP, 2020). Peregrine falcon (*Falco peregrinus*) have also been recorded breeding on the main stack of the Drax Power Station in previous years and were recorded on site during surveys in spring 2020 (WSP, 2020).

9.2.6. The following additional sources of information are expected to be used in the final EIA:

- Local biological records obtained from North and East Yorkshire Ecological Data Centre (NEYEDC);
- A Preliminary Ecological Appraisal (PEA);
- Species specific surveys, as required; and
- Information on other plans and projects, for the purposes of cumulative impact assessment.

9.3. STUDY AREA

9.3.1. The ZoI for the Proposed Scheme is the area over which changes arising from the construction and operation could lead to ecologically significant changes to the environment. The potential ZoI will vary between different ecological features and in relation to the stage of the project being considered. For example, operational emissions from the Carbon Capture Plant could lead to potentially significant changes in air quality several kilometres from the Proposed Scheme. Conversely, disturbance of existing habitats for installation of the Upgraded Drax Jetty will be confined to a limited footprint around the River Ouse.

9.3.2. The ZoI to be used in the ES will be refined as more information becomes available regarding the potential ecological effects of the Proposed Scheme, and the ecological resources present. For the purpose of this EIA Scoping Report, a precautionary ZoI has been used to identify potentially sensitive receptors / Important Ecological Features considered, as set out in Table 9.1.

Table 9.1 – Potentially Sensitive Receptors / Important Ecological Feature ZoI

Receptor	Potential Zone of Influence
Internationally important designated nature conservation sites, including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites.	15 km radius from Proposed Scheme, in line with Study Area for air quality assessment. This ZoI has been reached on the basis of initial dispersion modelling.

Receptor	Potential Zone of Influence
Nationally important designated nature conservation sites, including National Nature Reserves (NNR); Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).	5 km radius from Proposed Scheme
Locally important designated nature conservation sites (Sites of Importance for Nature Conservation (SINC) and Local Wildlife Sites (LWS)); areas of ancient woodland.	2 km radius from Proposed Scheme
Priority Habitats[3]; protected and notable species.	100 m buffer around the Proposed Scheme, extended up to 500 m for great crested newts and wintering birds.

9.3.3. The MAGIC web portal was used to identify statutory designated nature conservation sites within 10 km of the Site Boundary for the purpose of this EIA Scoping Report. The MAGIC portal was also used to confirm areas included on the ancient woodland inventory within 2 km of the Site Boundary and areas of Priority Habitat within 100 m of the Site Boundary.

9.4. SENSITIVE RECEPTORS / RESOURCES

9.4.1. The desk study and survey work completed to date has identified designated sites, habitats and protected or otherwise notable species that may be 'Important Ecological Features', as defined in the Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment (EcIA) Guidelines (CIEEM, 2018). These are ecological features that are considered important for nature conservation at a particular geographic scale and are also within the potential ZoI of the Proposed Scheme.

9.4.2. The desk study identified ten statutory nature conservation sites of International or European importance within 15 km of the Site Boundary and six statutory nature conservation sites of national or local importance within 5 km of the Site Boundary. The closest internationally important designated nature conservation site is the River Derwent SAC / SSSI, located approximately 0.1 km to the north-east. Statutory nature conservation sites are described in Table 9.2, below.

[3] As identified by the Secretary of State in response to the requirements of Section 40 of the Natural Environment and Rural Communities Act (2006).

Table 9.2 – Internationally and Nationally Designated Sites within relevant ZoI from the Site Boundary

Designated Site	Designation(s)	Distance from Proposed Scheme	Description
River Derwent	SAC, SSSI	0.1 km to the north-east	The River Derwent in Yorkshire is considered to represent one of the best British examples of the classic river profile. It supports diverse communities of aquatic flora and fauna, many elements of which are nationally significant. The river is also noted for its diversity of fish species. The riverine habitat also supports an excellent breeding bird community.
Barlow Common	LNR	2.1 km to the west	This site was previously used for tipping ballast and has since been reclaimed. It has a mosaic of woodland, wetland, reedbeds and four large ponds. Two ponds attract wild fowl and migrating waders. 140 species of birds have been recorded on site. The colonised tip supports over 200 species of plants. This rich flora supports diverse invertebrates.
Eskamhorn Meadows	SSSI	2.3 km to the south-east	This is a nationally important site for species-rich neutral grassland. In addition, small numbers of curlews (*Numenius arquata*) and lapwings breed in the meadows.
Lower Derwent Valley	SPA, SAC, Ramsar, NNR	4.2 km to the north-east	The Yorkshire Derwent is considered to represent one of the best British examples of the classic river profile. It supports diverse communities of aquatic flora and fauna, many elements of which are nationally significant. During the winter the Lower Derwent is vital in maintaining internationally important population of Bewick's swans (*Cygnus columbianus bewickii*).
Barn Hill Meadows	SSSI	4.3 km to the east	Barn Hill Meadows comprise seven fields lying just to the west of Howden, in the flood plain of the Old Derwent. The site is important for its herb-rich,

Designated Site	Designation(s)	Distance from Proposed Scheme	Description
			unimproved, neutral grassland, a habitat now uncommon in the intensively farmed landscape of Humberside and in lowland England generally.
Humber Estuary	SAC, SPA, SSSI, Ramsar	4.9 km to the east	The Humber is the second-largest coastal plain estuary in the UK, and the largest coastal plain estuary on the east coast of Britain. Habitats within the Humber Estuary include Atlantic salt meadows and a range of sand dune types in the outer estuary, together with subtidal, extensive intertidal mudflats, glasswort (*Salicornia* sp.) beds and coastal lagoons. Significant fish species include river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*).
Skipwith Common	SAC, NNR	7.2 km to the north	The northern Atlantic wet heath at Skipwith Common is the most extensive of its type in the north of England. There is a small population of marsh gentian (*Gentiana pneumonanthe*). The wet heath is part of transitions from open water, fen, reed and swamp to European dry heaths and other habitats. The site has great ornithological and entomological importance.
Thorne & Hatfield Moors	SAC, SPA, SSSI	9.3 km to the south east	Thorne Moor is England's largest area of raised bog, lying a few kilometres from the smaller Hatfield Moors, both within the former floodplain of the rivers feeding the Humber Estuary (Humberhead Levels), and includes the sub-components Goole Moors and Crowle Moors. At the time of its classification, the SPA supported 66 pairs of nightjar (*Caprimulgus europaeus*), representing at least 1.9% of the breeding population in Great Britain.

9.4.3. The majority of habitats recorded within the Site Boundary and surrounding areas are predicted to be common and widespread and highly influenced by human activity (for example arable farmland, buildings and areas of hard-standing) based on the information available from the previous projects and publicly available sources detailed above (Section 9.1). However, some areas within the Site Boundary, notably to the north of the Drax Power Station and associated with the Existing Drax Jetty, support habitats of greater ecological interest.

9.4.4. The ecological assessments completed for the previous projects suggest the following protected or otherwise notable species will or may be relevant to the Proposed Scheme:

- Bats;
- Badger (Meles meles);
- Otter (Lutra lutra);
- Water vole (Arvicola amphibious);
- Breeding and wintering birds;
- Amphibians; and
- Invasive non-native species.

9.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

9.5.1. This assessment has been completed assuming delivery of Primary, Secondary and Tertiary Mitigation Measures as part of the Proposed Scheme. These assumed mitigation measures are set out in Table 9.3, below. It should be noted that a number of ecological surveys have yet to be completed due to seasonal restrictions on when they can be carried out. The identified mitigation is therefore provided on a precautionary basis. Where existing knowledge of ecological resources and the Proposed Scheme allows, likely requirements for Secondary mitigation have been identified. Completion of further ecological surveys may provide data confirming that some mitigation measures proposed below are not needed and/or that additional measures are required; this will be confirmed during preparation of the Preliminary Environmental Information Report (PEIR) and ES as appropriate.

Table 9.3 – Assumed Mitigation Measures

Measure	Primary, Secondary, or Tertiary	Description
Avoidance of habitats with potential to support protected species	Primary	Land to the north of the Drax Power Station may be used for the creation/enhancement of habitats, to address the wider effects of the Proposed Scheme. Where existing habitats in these areas could support protected species, Measures Measures to avoid effects on these will be incorporated into the Proposed Scheme.
Biodiversity Net Gain (BNG)	Secondary	The Proposed Scheme will explore options to deliver BNG. This would involve identifying compensatory habitat to offset any impacts on habitats that cannot be avoided or mitigated.
Great Crested Newt Mitigation Measures	Secondary	A population of great crested newts was recorded within the Site Boundary (north of the Drax Power Station) during surveys in 2020 (WSP, 2020). Mitigation Measures to avoid or minimise effects on this species and its habitats may be required. Any such requirements will be confirmed through additional survey work and the EcIA.
Wintering Bird Mitigation Measures	Secondary	Mitigation Measures to minimise disturbance of wintering birds may be required in relation to the Upgraded Drax Jetty works. The need for and detail of any such measures will be confirmed through completion of further survey work and the EcIA.
Otter Mitigation Measures	Secondary	Mitigation Measures to minimise impacts on otter may be required in relation to the Upgraded Drax Jetty works. The need for and detail of any such measures will be confirmed through completion of further survey work and the EcIA.

Measure	Primary, Secondary, or Tertiary	Description
Construction Environmental Management Plan (CEMP)	Tertiary	The construction phase environmental impacts of the Proposed Scheme will be managed through implementation of a CEMP. The CEMP will include a series of measures, based on best-practice guidance, to control the environmental effects of construction of the Proposed Scheme. For example, these could include: measures aimed at controlling noise and light impacts; measures such as the use of fencing to demarcate the construction footprint and protect adjacent ecological features; methods for managing waste; and methods for addressing pollution incidents, should they occur. These measures are expected to form an important part of efforts to control construction phase impacts on habitats and protected or otherwise notable species.

9.5.2. Opportunities to deliver ecological enhancements will be considered through the detailed design of the Proposed Scheme. This may include the provision of habitat creation and enhancement within the Site Boundary, in land to the north of the Drax Power Station. Such measures may also form part of BNG provision and deliver wider environmental benefits as part of the landscape design.

9.5.3. The Proposed Scheme will be overall carbon negative, which would contribute to global measures to reduce climate change. The Proposed Scheme would therefore contribute to the biodiversity benefits that would arise from reducing climate change.

9.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

Impacts scoped in or out of further assessment

9.6.1. The impacts scoped in or out for Ecology are as follows:

Table 9.4 – Ecology – Impacts Scoped In or Out of Further Assessment

Impact	Phase	Scoped In	Scoped Out	Justification
Alteration or degradation of habitats within designated sites as a result of emissions to air and accidental release of hazardous materials.	Construction Operation	Y		At present, potential risks from changes to air quality during construction or operation are not known. Potential impacts are therefore included at this stage.
Permanent or temporary removal or disturbance of habitats within and adjacent to the Proposed Scheme leading to the destruction or damage of HPI or habitats otherwise of ecological importance.	Construction Operation	Y		A range of habitats are present within and adjacent to the Site Boundary. These include habitats that are known or have potential to be HPI.
Loss and/or disturbance of protected species and their habitats due to demolition and construction activities, including construction traffic.	Construction Operation	Y		At present the direct and indirect impacts to protected species and their habitats during construction or operation are not understood in detail. Potential impacts are therefore included at this stage.
Disruption of ecological networks provided by habitats that will be lost, altered or disturbed by construction.	Construction	Y		At present the impacts to ecological networks during construction or operation are not known. Potential impacts are therefore included at this stage.
Loss or disturbance of common and widespread	Construction Operation		Y	The loss or disturbance of common and widespread habitats of limited nature conservation importance (for

Impact	Phase	Scoped In	Scoped Out	Justification
habitats of negligible nature conservation importance				example arable farmland) are not expected to lead to significant ecological effects, and therefore such effects are unlikely to be assessed in detail in the EcIA. Effects on protected or otherwise notable species that are confirmed to use these habitats would still be assessed as part of the wider assessment for those species.
Temporary disturbance of common and widespread species of negligible nature conservation importance	Construction Operation		Y	Temporary disturbance of common and widespread species of negligible nature conservation importance will be managed through generic control measures and is considered unlikely to result in significant effects to Important Ecological Features. As such, this is not expected to require consideration in the EcIA.

9.7. PROPOSED ASSESSMENT METHODOLOGY

9.7.1. The legislation and policy relevant to assessment of the Proposed Scheme is listed below:

- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Habitats Regulations) (Her Majesty's Stationary Office (HMSO), 2019);
- The Wildlife and Countryside Act 1981 (as amended) (WCA) (HMSO, 1981);
- Countryside and Rights of Way (CROW) Act 2000 (HMSO, 2000);
- The Natural Environment and Rural Communities (NERC) Act 2006 (HMSO, 2006);
- The Protection of Badgers Act 1992 (HMSO, 1992);
- The Hedgerows Regulations 1997 (HMSO, 1997);
- The Wild Mammals (Protection) Act 1996 (HMSO, 1996);
- The UK Post-2010 Biodiversity Framework (2011-2020) (Joint Nature Conservation Committee (JNCC) and Department for Environment, Food & Rural Affairs (DEFRA), 2012);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011);
- UK Biodiversity Action Plan (UKBAP) (JNCC Biodiversity Reporting and Information Group, 2008)4;
- The National Planning Policy Framework (NPPF) 2019 (Department for Communities and Local Government (DCLG), 2012);
- Selby District Local Plan (SDLP) 2005 (retained policies) (Selby District Council, 2005); and;
- The Selby District Core Strategy Local Plan 2013 (Selby District Council, 2013).

9.7.2. Relevant parts of the assessment will be undertaken in line with the following best practice guidelines:

- Nationally Significant Infrastructure Project (NSIP) Advice Note 10 (The Planning Inspectorate, 2016);
- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017); and
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1 (CIEEM, 2018).

[4] The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework; however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

9.7.3. In early 2021 a PEA, supported by a desk study and Extended Phase 1 habitat survey, will be produced following completion of an Extended Phase 1 habitat survey.

9.7.4. Given the potential for the habitats within the Site Boundary to support a number of protected species (Section 9.3), additional targeted protected species surveys will be required prior to any assessment of effects. Dependent on the findings of the PEA and emerging details of the Proposed Scheme, this may include surveys for the following:

- Bats (foraging and commuting activity and roost assessment surveys);
- Badgers;
- Otter;
- Water vole;
- Breeding and wintering birds; and
- Amphibians.

9.7.5. Wintering bird surveys were commenced in October 2020 and are expected to continue until March 2021. These are gathering data on the use of habitats adjacent to the Existing Drax Jetty and the associated access route from the Existing Drax Jetty to the Drax Power Station. It is also expected that targeted surveys for great crested newts and other amphibians will be completed of ponds to the north of the Drax Power Station northern boundary, following the discovery of great crested newts in a pond in this location in June 2020.

9.7.6. The results of any additional survey works will be outlined within the relevant survey reports and the EcIA, presented as part of the ES. They may also be used to inform other assessment documents, such as the Assessment of Effects on Natural Features[5].

9.7.7. The EcIA will be a comprehensive assessment that collates relevant baseline information in order to predict the effects of the Proposed Scheme on Important Ecological Features.

9.7.8. The assessment will determine the potential effects arising from the construction and operation phases of the Proposed Scheme on Important Ecological Features, both with and without consideration of secondary mitigation measures.

9.7.9. A significant effect is defined as an effect that could have an impact upon the integrity or conservation status of a designated site, habitat/eco-system or species population where these are defined as Important Ecological Features. The relative importance of ecological features will be valued against a geographic frame of reference.

5 As required under Regulation 5(2)(l) of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009**Invalid source specified.**

9.7.10. Mitigation will be developed on an iterative basis, with the mitigation hierarchy followed; preference will be given to first avoiding effects, then reducing remaining effects, before applying targeted mitigation where necessary. Where residual effects remain after application of targeted mitigation measures, compensation will then be considered.

9.7.11. Best practice guidance for ecological impact assessment identifies that '…Scoping should be a flexible, adaptive and iterative process based on consultations, literature searches, site visits and discussions with the wider project team.' (CIEEM, 2018). The detailed scope of the ecological assessment for the EIA will be refined as the design of the Proposed Scheme is progressed and additional desk study and survey information becomes available.

9.7.12. In addition, a screening exercise to assess the potential for Likely Significant Effects (LSE) on internationally designated sites will be completed. Should the potential for LSE be confirmed, a detailed assessment to assess the potential for adverse effects on the integrity of these sites will also be completed. The findings of this will be reported concurrently with the ES and will be used to inform the assessment within the ES where relevant.

9.7.13. Pre-application consultation with Natural England, the Environment Agency (EA), and the North Yorkshire County Council (NYCC) Ecologist will also be used to seek agreement to the detailed scope of the ecological assessment in advance of submission of the DCO Application.

9.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

9.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- Requirements for species specific surveys will be determined by completion of the PEA and confirmation of the Proposed Scheme design and cannot be determined at this time.

9.9. REFERENCES

- CIEEM. (2017). Guidelines for Preliminary Ecological Appraisal, 2nd edition. Winchester.
- CIEEM. (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. . Winchester.
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10. LANDSCAPE AND VISUAL IMPACT

10.1. INTRODUCTION

10.1.1. This chapter considers the impacts of the Proposed Scheme on the landscape character and visual amenity of the immediate and surrounding Study Area during construction and operation and identifies any potential significant effects. It sets out the proposed methodology for the assessment and identifies those impacts that can be scoped out of the Environmental Impact Assessment (EIA).

10.2. BASELINE CONDITIONS

10.2.1. Drax Power Station consists of large industrial buildings edged by areas of offsite woodland plantation particularly to the north and northwest, located within the Levels Farmland and River Floodplain Landscape Character Types. The Site Boundary also includes open agricultural land to the north and north east, and Carr Lane to the Existing Drax Jetty alongside the River Ouse in the east. Views of the Drax Power Station are extensive from across the surrounding landscape as a result of the low landform and limited intervening vegetation and built form.

10.2.2. The following sources of information have been used to define the landscape and visual baseline conditions on which the assessment scope has been based:

- Review of the Landscape and Visual Impact Assessment (LVIA) and methodology for the Drax Repower Environmental Statement (ES) (ES-Volume 1-Chapter 10- Landscape and Visual Amenity (APP-078)) (WSP, 2018), including key sensitivities highlighted through the consultation process (acknowledging the Proposed Scheme would not be as tall and would have fewer tall structures);
- Knowledge of the Study Area from undertaking the LVIA for the Drax Repower ES (WSP, 2018);
- An overview of statutory plans and other data regarding relevant designations and planning policies for the Study Area; and
- A consideration of the landscape character of the Site with reference to published landscape character assessments.

10.2.3. The landscape and visual Baseline will be considered as its current state and its future condition. The current Baseline will include the following:

Landscape Receptors

- Site Landscape Character and Features: Consideration of the original design intent as set out by AE Weddle's 1966 Landscape and Mitigation Report (Weddle, 1966), noting the composition of site structures, symmetrical layout, colour and materials, aiming to reduce visual coalescence and site clutter. This also will consider the relationships of the

subsequent developments at Drax Power Station which have now become an established part of the Baseline.

- Landscape Character: The character of the Site and immediate surroundings. The character of the wider area as defined by the following Landscape Character Areas (LCA): Levels Farmland, River Floodplain particularly the River Aire Corridor, River Ouse Corridor, and Derwent Valley.
- Landscape Designations: There are no national landscape designations in proximity to the Proposed Scheme. The Lower Derwent Important Landscape Area (ILA) is the closest local designation with potential to be affected by the Proposed Scheme.

Visual Receptors

- Residents within 1 km of the Site Boundary - this will include residential receptors likely to experience a view and located on the edge of the settlements of Drax, Camblesforth, Long Drax, Barmby on the Marsh, residents off the A645, New Road, Main Road, Carr Lane / Redhouse Lane, Rusholme Lane, Wren Hall Lane and Pear Tree Avenue.
- Residential receptors within 3 km of the Site Boundary and likely to experience a view located on the edge of the following settlements - Carlton, Barlow, Hemingbrough, Rawcliffe and Airmyn / Little Airmyn.
- As the Proposed Scheme includes the Upgraded Drax Jetty, recreational users utilising the Trans Pennine Trail running along the northern banks of River Ouse and the Trans Pennine Trail National Cycle Route which runs along part of the River Ouse will be considered as potential sensitive visual receptors. This will be in addition to users of the Public Right of Way (PRoW) network and Drax Golf Course.
- The Baseline review and follow up site surveys will also determine whether users of the local transport network, educational and social facilities (such as places of worship) would be sensitive visual receptors in relation to this Proposed Scheme.

10.3. STUDY AREA

10.3.1. The Guidelines for Landscape and Visual Impact Assessment (GLVIA 3) (Landscape Institute and the Institute of Environmental Management and Assessment, 2013) clarify how study areas should be determined on a project specific basis. Paragraph 5.2 of GLVIA 3 states that the study area extent should be *"… based on the extent of Landscape Character Areas likely to be significantly affected either directly or indirectly" or "on the extent of the area from which the development is potentially visible, defined as the Zone of Theoretical Visibility, or a combination of the two*."

10.3.2. For the purposes of this assessment, the initial Study Area for assessing potentially significant landscape and visual effects is proposed to be a maximum 10 km radius from the Site Boundary with a focused 3 km Study Area on built and natural environment features. This is based on a combination of professional judgement and an initial analysis of the potential height and massing of the Proposed Scheme. This initial Study Area could be refined further in agreement with the Selby District Council (SDC), North Yorkshire County Council (NYCC) and East Riding of Yorkshire (EROY) and other relevant bodies, following design development stages when heights, massing and locations of structures are confirmed.

10.3.3. For potential landscape and visual Cumulative Effects, receptors located within the zone of visual influence (ZVI) within 10 km from the Site Boundary will be considered. However, the area considered for the purposes of identifying "other development" for the assessment of a cumulative effect will extend to a 15 km radius from the Site.

10.4. SENSITIVE RECEPTORS / RESOURCES

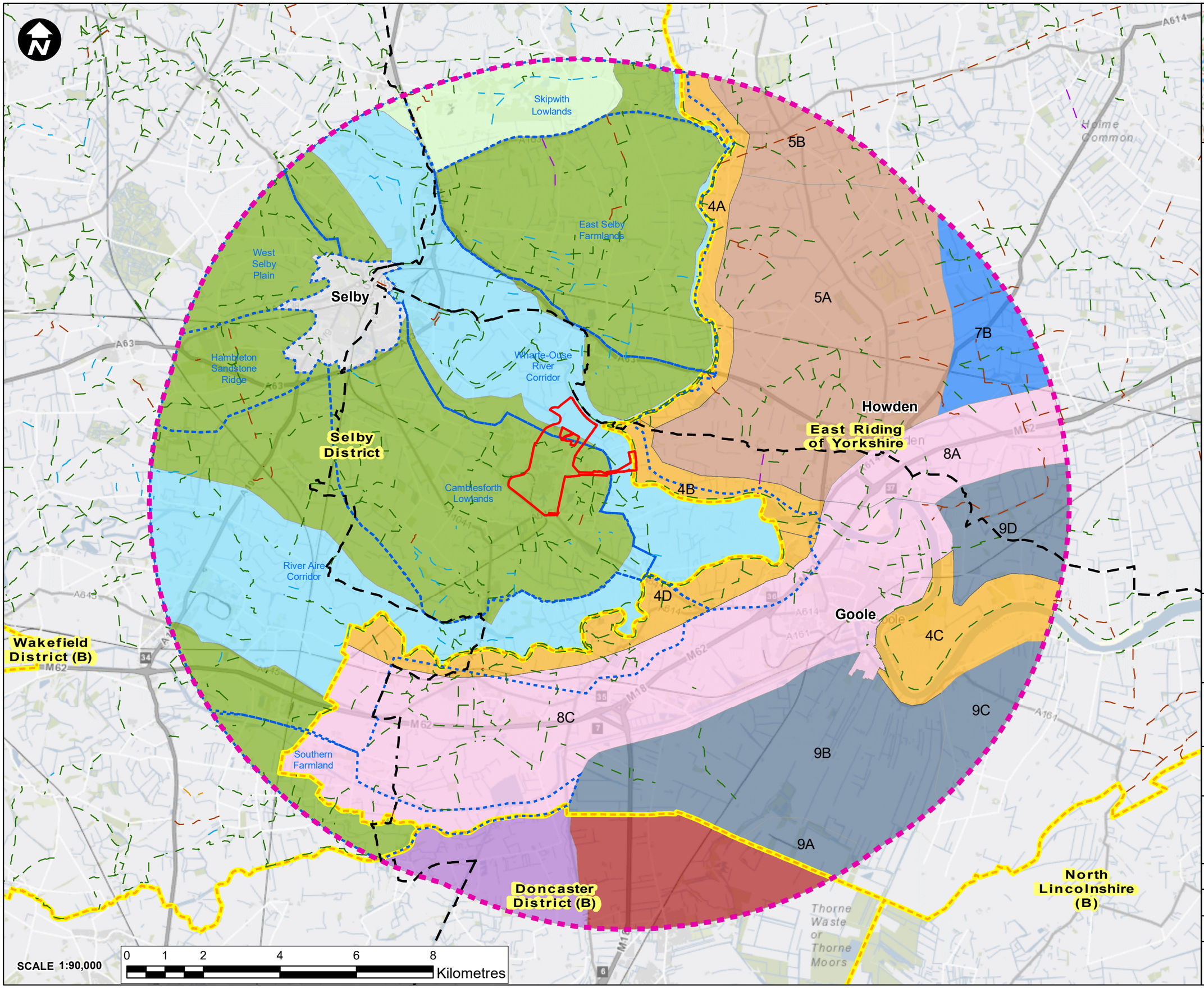
10.4.1. The following sensitive receptors have been identified and will be considered within the EIA. Landscape character types (LCT) and designations and PRoW are illustrated on Figure 10.1 the Landscape Constraints Plan.

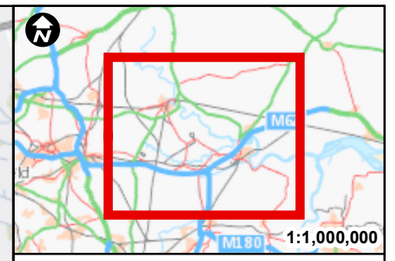
Landscape Receptors:

- Local Landscape Character and Landscape Features:
  - The Site.
  - Vegetation Cover: Plantations/tree belts and groups of trees, hedgerows, grassland, ornamental planting.
  - River Ouse.
- Landscape Character:
  - Levels Farmland LCT (23) (North Yorkshire and York Landscape Characterisation).
  - River Floodplains LCT (24) (North Yorkshire and York Landscape Characterisation).
  - River Corridor LCT (4) (East Riding of Yorkshire Landscape Character Assessment):
    - 4A Derwent Valley LCA – Barmby on the Marsh to Pocklington Canal Reach.
    - 4B River Ouse Corridor LCA - Barmby on the Marsh to M62 bridge.
    - 4D River Aire Corridor LCA.
- Landscape Designations:
  - Lower Derwent Valley ILA.

Visual Receptors:

- Visual Amenity
  - Local residents within 1 km of the Site, and between 1 and 3 km from the Site.
  - Recreational users of the Trans Pennine Trail and National Cycle Network.
  - Recreational users (PRoW network and other facilities).
  - Local road users (within 1 km of the Site, and between 1 and 3 km from the Site).





Key:

- Site Boundary
- Initial 10km Study Area

Public Rights of Way

- Byway Open to All Traffic
- Bridleway
- Footpath
- Restricted Byways
- Unsealed Unclassified Road (UUR)
- Trans Pennine Trail

District Boundary

- District Boundary

Selby District Landscape Character Assessment

- Local Landscape Character Area Boundaries

Doncaster Landscape Character Assessment

- F2: Owston to Sykehouse Settled Clay Farmlands
- G2: Thome and Hatfield Peat Moorlands

North Yorkshire and York Landscape Characterisation

- 1: Urban Landscape Character Type (LCT)
- 23: Levels Farmland (LCT)
- 24: River Floodplain (LCT)
- 28: Vale Farmland with Plantation Woodland and Heathland (LCT)

East Riding of Yorkshire Landscape Character Assessment

- Type 4: River Corridors (LCT)
- Type 5: Open Farmland (LCT)
- Type 7: Foulness Open Farmland (LCT)
- Type 8: M62 Corridor Farmland (LCT)
- Type 9: Drained Open Farmland (LCT)

drax

PROJECT TITLE
DRAX BECCS DCO

DRAWING TITLE
FIGURE 10.1 – LANDSCAPE CONSTRAINTS PLAN

DRAWING STATUS
FOR ISSUE

DRAWN	CHECKED	APPROVED	AUTHORISED
LH	BS	SJ	CS

SCALE @ A3 SIZE	DATE	REVISION
1:90,000	12/01/2021	P01

DRAWING NUMBER
EN010120-PA-SCO-10.1-Sheet1

10.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

10.5.1. As an inherent part of the design process, landscape and visual effects will be considered in relation to the Proposed Scheme, as well as consented mitigation proposals and the original design intent as set out by AE Weddle in his 1966 Landscape and Mitigation Report (Weddle, 1966). This also acknowledges the age of the Weddle report and the subsequent developments at Drax Power Station since its publication which have now become an established part of the Baseline.

10.5.2. Landscape and habitat mitigation and/or enhancements on and offsite are potential considerations, depending on the final details of the Proposed Scheme.

10.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

10.6.1. The impacts scoped in or out for LVIA are as follows:

Table 10.1 – Landscape and Visual Impact – Impacts Scoped In or Out of Further Assessment

Impacts	Phase	Scoped In	Scoped Out	Justification
Changes to landscape character within the Site Boundary and Study Area due to construction activities and associated plant.	Construction	Y		The construction activities to build the Proposed Scheme have the potential to create temporary and permanent effects on landscape features through activities such as the clearance of vegetation and other material to restore the Upgraded Drax Jetty and enabling space for new buildings and structures. Temporary, short-term effects on landscape character potentially would occur from the presence and movement of construction plant and associated temporary construction infrastructure.
Changes to landscape character within the Site Boundary and Study Area due to new built form, use of new infrastructure, and landscaping.	Operation	Y		The Proposed Scheme will introduce new permanent structures to the Drax Power Station site that have the potential to affect the existing (and future) Baseline Landscape Character of the Site and Study Area.
Changes to existing visual amenity of surrounding sensitive receptors due to construction activities and associated plant.	Construction	Y		The construction activities to build the Proposed Scheme have potential to create temporary and permanent changes on Visual Amenity through vegetation clearance and other material removal. Temporary, short-term effects on Visual Amenity would also potentially occur from the presence and movement of construction plant and associated temporary construction infrastructure.

Impacts	Phase	Scoped In	Scoped Out	Justification
Changes in existing visual amenity of surrounding sensitive receptors due to new built form and landscaping.	Operation	Y		The Proposed Scheme will introduce new permanent structures to the Drax Power Station site which have the potential affect the existing (and future) Baseline Visual Amenity of Receptors within the Study Area.

10.7. PROPOSED ASSESSMENT METHODOLOGY

10.7.1. The LVIA would follow guidance described in The Guidelines for Landscape and Visual Assessment (GLVIA 3)*)* (Landscape Institute and the Institute of Environmental Management and Assessment, 2013). Additionally, guidance in An Approach to Landscape Character Assessment (Natural England, 2014*)* (Natural England, 2014) would be followed. Reference would also be made to relevant local planning policy documents, regional and local guidance including landscape character assessments as well as aerial photographs and Ordnance Survey data.

10.7.2. The final extent of the Study Area and number of viewpoints proposed would be proportionate to focussing on significant effects only. A Zone of Theoretical Visibility (ZTV) of the tallest elements of the Proposed Scheme would be produced by computer modelling, based on the Ordnance Survey digital terrain model (DTM) or the Environment Agency Light Detection and Ranging (LiDAR) digital surface model.

10.7.3. On review, it is considered that six of the viewpoints from the Drax Repower ES LVIA would be relevant for the Proposed Scheme. It is also proposed that three additional Viewpoints at or near the Upgraded Drax Jetty would be necessary to include to aid the assessment of this part of the proposal. The following viewpoints are proposed as an initial list (subject to site survey and final Proposed Scheme details):

- PRoW Close to Loftsome Bridge (Drax Repower LVIA Viewpoint (VP) 2).
- Pear Tree Avenue close to PRoW (Drax Repower LVIA VP3).
- PRoW close to Drax Village and Read School (Drax Repower LVIA VP9).
- PRoW along Long Hedge Lane, north of Carlton (Drax Repower LVIA VP10).
- Barlow Road close to A1041 (Drax Repower LVIA VP16).
- Permissive Path close to Brown Cow Lane (Drax Repower LVIA VP17).
- Trans Pennine Trail– opposite the Existing Drax Jetty (new viewpoint).
- Trans Pennine Trail – north east of the Existing Drax Jetty (new viewpoint).
- Redhouse Lane, west of the Existing Drax Jetty (new viewpoint).

10.7.4. The nature of visual and landscape receptors and the likely effects of the Proposed Scheme would be verified in the field through site visits.

10.7.5. The necessity for photomontages from agreed viewpoints will be determined in consultation with NYCC, EROY, and SDC and based on field verified viewpoints. All photographs and visualisations will be produced in line with Technical Guidance Note (TGN) 06/19 Visual Representation of Development Proposals (Landscape Institute, 2019). Annotated photo-panoramas (to TGN 06/19 Type 1) or wirelines (to TGN 06/19 Type 2) of the Proposed Scheme

would be produced for all viewpoints, and photomontages (to TGN 06/19 Type 3) for a selection of up to five viewpoints.

10.7.6. Cumulative Effects with any other proposed development of a similar type within the Study Area will be considered in the assessment. Chapter 17 (Cumulative Effects) sets out the approach to identifying cumulative sites.

10.7.7. The significance of effect would be determined by combining the assessed sensitivity (derived from value of the receptor and susceptibility to the Proposed Scheme) of the landscape or visual receptor with the anticipated scale, extent and duration of impacts from the Proposed Scheme. Effects would be assessed for the Construction Phase, Operational Phase (either in year 1 or when changes are most obvious), and 15 years after commencement of operations when any mitigation planting, if required, would be considered to have matured to maximum effectiveness. Landscape mitigation proposals would identify potential effects that could reasonably be mitigated through landscape design, and an assessment would then be undertaken of the predicted significance of residual effects with reference to policy compliance.

10.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

10.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- As exact heights and massing of the Proposed Scheme are not confirmed at this stage, the proposed Study Area and viewpoint locations may be subject to change.
- The visual envelope for the Proposed Scheme will be prepared based on a desk-based review and production of a ZTV (using bare earth data only) followed by survey work and the application of professional judgement.
- The assessment of the views from private properties will be based on representative viewpoints from publicly accessible locations and professional judgement. A residential visual amenity survey is not proposed.
- Photography used to inform the assessment will likely be taken during the Spring 2021. Reuse of the viewpoint photography for the Drax Repower ES will be considered where field surveys confirm no changes to the Baseline since they were produced.
- Photomontages in accordance with TGN 06/19 Type 3 are proposed for up to five viewpoints only and will represent year 1 and year 15 of operation. Other viewpoints will be produced as annotated photo-panoramas (Type 1) or wirelines (Type 2).
- Assessment of the effects of lighting during the Construction Phases will not be included on the basis that it would be temporary and within the context of existing operational lighting.

10.9. REFERENCES

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11. HERITAGE

11.1. INTRODUCTION

11.1.1. This chapter considers the impacts of the Proposed Scheme on the historic environment during construction and operation, and any potential significant effects. It sets out the proposed methodology for the historic environment assessment and identifies those impacts that can be scoped out of the Environmental Impact Assessment (EIA).

11.2. BASELINE CONDITIONS

11.2.1. The following data sources have been used to inform the historic environment Baseline and provide an initial indication of the likely key issues for the assessment. Note that the EIA itself will consult much broader range of sources to provide a comprehensive Baseline:

- Historic England's National Heritage List: statutory Designated Heritage Assets (World Heritage Sites (including buffers), scheduled monuments, listed buildings, registered parks and gardens and registered battlefields);
- Drax Repower Environmental Statement ES (WSP, 2018);
- Selby District Council (SDC) and East Riding of Yorkshire (ERoY) Council conservation areas (Selby District Council, 2020) (East Riding of Yorkshire Council, 2021);
- Online historic Ordnance Survey Mapping; and
- Summary of land-uses within the Site Boundary which have the potential to influence the scope.

11.2.2. Within the area of the Proposed Scheme, but excluded from the Site Boundary, there is a single scheduled monument: Drax Augustinian Priory (National Heritage List for England (NHLE):1016857).

11.2.3. A total of 513 Designated Heritage Assets and areas are present within 10 km of the Proposed Scheme. They comprise:

- 20 scheduled monuments (including Drax Augustinian Priory);
- 480 listed buildings (15 Grade I listed, 18 Grade II* and 447 Grade II listed buildings); and
- 13 conservation areas.

11.2.4. There are no world heritage sites, registered battlefields or registered parks and gardens within 10 km of the Proposed Scheme.

11.2.5. The Proposed Scheme and surrounding environment are located in the Humberhead Levels, which has evidence of a rich historic environment dating from the Iron Age (c 700BC to AD60) to the modern period (1901 onwards). This reflects the region's varied social and economic history. Known prehistoric

period assets are predominantly burial mounds and parts of linear dyke systems, with known settlements from the Romano-British period (AD60 to AD410). Known assets dating to the medieval period (1066 to 1540) include rural sites such as moated sites, the remains of monasteries and mills, and areas of ridge and furrow cultivation. Many of the villages and towns originated in the early medieval period (AD410 to AD1066), and they retain some medieval structures such as churches, as well as elements of their original plan forms. In addition, the Humberhead Levels is considered to provide a considerable palaeoenvironmental resource, and the study of the wetland deposits such as the peats, silts and clays, provides important information on past environments and climatic conditions (WSP, 2017).

11.2.6. Non-designated Heritage Assets identified from the Historic Environment Record (HER) within 500 m of the Proposed Scheme include buried heritage sites/remains, buildings and find spots from various time periods including early Iron Age, Roman, Medieval, 19th and 20th centuries. Trial trenching at Drax Abbey farm (adjacent to 12th Century Drax Augustinian Priory) found evidence for Romano-British occupation in the form of pits and ditches. Romano-British activity is also represented in the wider landscape, including the site of Drax Roman Villa located near a now relict course of the River Aire close to a former confluence with the River Ouse (Salford Archaeology, 2018). Archaeological features dating to the 13th/14th century, together with a series of undated features, were revealed in 2018 during the Drax Repower ES. These features located to the south of the River Ouse probably relate largely to medieval field systems and boundaries (Salford Archaeology, 2018).

11.2.7. Drax Power Station was constructed in the late 1960s and opened in 1973 and was the largest of the 14 “super stations” built at this time. It was originally built, owned and operated by the Central Electricity Generating Board and was constructed and commissioned in two stages. Stage one was completed in 1974, and 12 years later in 1986 stage two was completed.

11.2.8. Historic Landscape Character data defines the Drax Power Station as ‘Industrial’, and the surrounding area as ‘Enclosed Land’.

11.3. STUDY AREA

11.3.1. The Study Area will include the settings of any designated or other cultural heritage resource in the footprint of the Proposed Scheme, within the Zone of Visual Influence (ZVI) or potentially affected by noise, in accordance with Design Manual for Roads and Bridges (DMRB[6]) LA 104 (Highways England, 2020) and LA 106 (Highways England, 2019).

[6] Please note, DMRB guidance is the standard guidance applied for Historic Environment contributions to Environmental Impact Assessment.

11.3.2. Given the generally rural nature of the Proposed Scheme's immediate environs, along with the topography of the local landscape, it is proposed to use a Study Area of 10 km extending out from the Site Boundary for the assessment of Designated Heritage Assets. Within the 10km Study Area any Designated Heritage Assets and areas, the heritage significance of which might be affected through a change in their setting during construction and operation of the Proposed Scheme, will be identified. The ZVI for the 10 km area will be used to assist in the identification of heritage assets that require scoping in for detailed assessment.

11.3.3. A second, inner Study Area of 500 m is proposed to identify and assess the potential for Below-Ground Heritage Assets within the Proposed Scheme. Based on professional judgement and experience of other similar schemes in this region, it is anticipated that this will provide an adequate data set to inform the Baseline and allow for an accurate prediction of the likelihood for currently unknown below ground archaeological remains within the Site Boundary.

11.3.4. The scope of the both the inner 500 m and the wider 10 km Study Areas may be refined during the assessment, as the impact of the Proposed Scheme during construction and operation is better understood.

11.4. SENSITIVE RECEPTORS / RESOURCES

11.4.1. The following sensitive receptors have been identified and will be considered within the EIA:

- Designated Heritage Assets (scheduled monuments, listed buildings and conservation areas) of medium to high value within the 10 km Study Area;
- Non-designated Above-Ground Heritage Assets and locally listed buildings of potential low to medium value within the Proposed Scheme and within the 500 m Study Area;
- Below-Ground Heritage Assets and palaeoenvironmental remains of potential low to high value within the Proposed Scheme; and
- Historic Landscape (including hedgerows of historic importance) of potential low to high value within the Proposed Scheme.

11.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

11.5.1. Mitigation measures will be developed as part of the design process and informed by the assessment. An appropriate mitigation strategy would aim to reduce or offset any significant adverse effects identified. Measures identified within the mitigation strategy would normally consist of design adjustments or investigation and recording, undertaken in accordance to the standards and guidance from Historic England (Historic England, 2017) (Historic England, 2016) and Chartered Institute for Archaeologists (CIfA) (Chartered Institute for Archaeologists (CIfA), 2014) (CIfA, 2014).

11.5.2. All mitigation proposed will be proportionate to the significance of the effect identified and the sensitivity of the asset affected.

11.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION PHASE

11.6.1. During construction, anything that would cause ground disturbance, such as preliminary ground works, site strip/topsoil removal, remediation, landscaping, planting, excavation for foundations, services, drainage and lighting, could potentially have an impact on known or possible Below-Ground Heritage Assets, palaeoenvironmental deposits and historic landscapes (including hedgerows). Any impacts would be permanent and irreversible and have the potential to result in significant effects. The potential for the presence of such heritage assets is judged to be very low within the Drax Power Station, however the potential is higher throughout the rest of the Site Boundary.

11.6.2. There is also a potential for impacts on heritage assets (designated and non-designated) and historic landscapes through temporary changes in setting as a result of construction activity, including temporary visual intrusion; an increase in noise, lighting and vibration from construction related vehicles, along with an increase in dust and pollution. Impacts would result in changes in the landscape around the asset, which could reduce the contribution of the setting to the value of the asset. This could result in a significant effect on assets where the setting contributes to their value.

OPERATIONAL PHASE

11.6.3. There is a potential for impacts on the setting of the heritage assets and historic landscapes (designated and non-designated) during operation. Impacts would result from a change in the landscape around the relevant asset, which could reduce the contribution of the setting to the value of the asset. Impacts could arise from the visual intrusion of the Proposed Scheme, which would change views towards and away from the asset. Impacts could also occur from a perceptible change in noise and lighting, which would change the way the asset is experienced. The impacts could be both adverse and beneficial, depending on the heritage asset, its location, the contribution of the setting to the value of the asset. There is a potential, therefore, for the operation of the Proposed Scheme to result in a significant effect (both adverse and beneficial).

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

11.6.4. The Impacts scoped in or out for Cultural Heritage are as follows:

Table 11.1 – Heritage – Impacts Scoped In or Out of Further Assessment

Element	Phase	Scoped In	Scoped Out	Justification
Drax Augustinian Priory (NHLE:1016857)	Construction Operation	Y		The Heritage Asset is surrounded by the Proposed Scheme but not located within it. Due to the proximity, there is a potential for impacts on the Heritage Asset during construction and impacts during construction and operation due to a change in setting. There are potential impacts during construction to unknown archaeological assets / remains associated with the monument that exist outside its curtilage, which would be of high/national value.
Designated Heritage Assets within 10 km of the Proposed Scheme	Construction Operation	Y		There is a potential for direct impacts on Heritage Assets in the wider landscape during construction and operation due to a change in setting.
Non-designated Built Heritage Assets located within the Site Boundary	Construction Operation	Y		There is a potential for direct impacts on Non-Designated Heritage Assets (i.e. Drax Power Station) located within the Site Boundary during construction and operation due to a change in setting. The proposals do not include the demolition of any existing buildings so no direct, physical impacts are anticipated on Non-Designated built Heritage Assets within the Site Boundary.

Element	Phase	Scoped In	Scoped Out	Justification
Non-Designated and locally listed built Heritage Assets within 500 m of the Proposed Scheme	Construction Operation	Y		There is a potential for direct impacts on Heritage Assets in the wider landscape during construction and operation due to a change in setting.
Below-Ground Heritage Assets and palaeoenvironmental deposits within the Site Boundary.	Construction	Y		There is a potential for direct physical permanent impacts during construction on known or possible Below-Ground Heritage Assets and palaeoenvironmental within the Proposed Scheme as a result of construction works. The potential for the significant effects is higher in the areas outside of the Drax Power Station where there has been limited previous ground disturbance.
Historic Landscapes	Construction Operation	Y		There is a potential for a direct impact on historic landscapes and hedgerows of historic importance during construction, resulting in the loss of the Landscape Character. There is a potential for impacts on the setting of historic landscapes during construction and operation.

11.7. PROPOSED ASSESSMENT METHODOLOGY

11.7.1. The following methodology for assessment is proposed:

- DMRB LA 106 states that a detailed assessment for archaeological remains and Non-designated Heritage Assets should comprise a Historic Environment Desk-Based Assessment (HEDBA) (Highways England, 2019) . The HEDBA will include a narrative of the historical and archaeological context of the Site Boundary and immediate environ within the 500m Study Area. The HEDBA will include a site visit, which will be undertaken for the purposes of identifying any previously unrecorded archaeological assets within the Site Boundary. The site visit will also assess the effect of the Proposed Scheme on the settings of designated assets within the 10 km Study Area. The HEDBA will present the significance of assets on which there is a predicted impact from the Proposed Scheme using the prescribed National Planning Policy Framework (NPPF) values (aesthetic, archaeological, architectural and historical) (Ministry of Housing, Communities and Local Government, 2019). The HEDBA will be prepared in accordance to Historic England and CIfA standards and guidance (Historic England, 2017), (CIfA, 2020) and (CIfA, 2014).
- The requirement for additional archaeological evaluation (e.g. geophysical survey, trial trenching) to support the EIA will be determined in consultation with North Yorkshire County Council (NYCC) Principal Archaeologist.
- Loss or disturbance of known and unknown Below-Ground Heritage assets, palaeoenvironmental deposits and historic landscapes will be considered qualitatively in line with the principles set out in DMRB (Highways England, 2020) and NPPF (Ministry of Housing, Communities and Local Government, 2019), based on the combination of the potential value of any assets identified and the magnitude of harm associated with the Construction Phase of the Proposed Scheme;
- Consideration of changes in fabric of Non-Designated Heritage Assets will be undertaken qualitatively using the principles outlined in the DMRB (Highways England, 2020) and (Highways England, 2019) and NPPF (Ministry of Housing, Communities and Local Government, 2019) and based on the value of the assets evaluated against the likely magnitude of harm due to the Proposed Scheme; and
- The qualitative evaluation of potential effects upon the setting of Designated and Non-Designated Heritage Assets will be undertaken in line with the methodology set out in Chapter 3 (EIA Methodology), Section 3.8 of this EIA Scoping Report and in accordance with Historic England's The Setting of Heritage Assets (Historic England, 2017) and the requirements set out by the NPPF (Ministry of Housing, Communities and Local Government, 2019).

11.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

11.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment will be compiled using Heritage Asset data obtained from third party sources (e.g. HER) and the prediction of effects will be based on the accuracy of the data received.
- Due to the nature of below-ground (archaeological) remains, their identification and assessment necessarily requires an element of assumption. The nature, extent, survival, and even the precise location, of buried archaeological remains are often uncertain, as the majority of such sites have never been subject to archaeological investigation to modern standards. Assessment of the value of such sites (as part of the assessment process) is often, therefore, heavily reliant on informed extrapolation from limited data, comparison with similar assets in similar contexts and, ultimately, on professional judgment.
- The assessment will not include any internal inspections or surveys inside of any built Heritage Assets or properties.
- The assessment assumes that the East Riding Archives (Beverley), Selby Local Studies Library and North Yorkshire County Record Office (Northallerton) will be accessible. If they are closed, all reasonable efforts will be made to obtain the relevant information from other local repositories or online.

11.9. REFERENCES

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12. GROUND CONDITIONS

12.1. INTRODUCTION

12.1.1. This chapter considers the impacts of the Proposed Scheme on ground conditions during the Construction and Operational Phases, and any significant effects. It outlines the proposed assessment methodology for the impacts to ground conditions and identified impacts that can be scoped out of the assessment.

12.2. BASELINE CONDITIONS

12.2.1. Historically, the Site was undeveloped agricultural land from ca. 1851. In 1891, a railway and engine house were present in the east. In 1938, a 'depot' was present in the west which was a former airship factory, munitions depot and prisoner of war camp during World War II. From 1974, the Drax Power Station site is present. This expands throughout the latter part of the 20th Century to include a sewage works.

12.2.2. British Geological Survey (BGS) mapping indicates that the superficial deposits underlying the Site include Alluvium (clay, silt, sand and gravel), Warp (clay and silt), Hemingbrough Glaciolacustrine Formation (glacigenic silty clay) and the Breighton Sand Formation (fluvial and aeolian sands). The superficial deposits are underlain by a bedrock geology comprising the Sherwood Sandstone Group. Based on the previous uses and development of the Site, Made Ground is anticipated to be present.

12.2.3. The Environment Agency (EA) classifies the superficial Alluvium, Warp and Breighton Sand Formation as Secondary A Aquifers. The Hemingbrough Glaciolacustrine Formation is classified as Unproductive strata. The Sherwood Sandstone Group is classified as a Principal Aquifer. A groundwater abstraction is located within the Site Boundary and is used for General Agriculture: Spray Irrigation and sourced from the Sherwood Sandstone Group. Further information regarding aquifer classifications, abstractions and groundwater levels is presented in Chapter 13 (Water Environment).

12.2.4. The majority of the Site is located within a Zone III (Total Catchment) Source Protection Zone (SPZ).

12.2.5. A number of sensitive surface water features are present within the vicinity of the Site Boundary including field drains and the River Ouse. Two surface water abstractions are located within the Site Boundary and are used for General Agriculture: Spray Irrigation. Drax Power Station also abstracts surface water from the River Ouse.

12.3. STUDY AREA

12.3.1. This Chapter of the ES will establish the existing ground conditions underlying the Proposed Scheme and surrounding area upon which to assess the likely significant effects of the Proposed Scheme on the ground conditions. The assessment will include a detailed Study Area up to a 250 m radius from the Site Boundary in relation to risk to human health. The Study Area will extend up to a 1 km radius from the Site Boundary in relation to sensitive Controlled Water receptors only, which is considered appropriate for indirect effects.

12.4. SENSITIVE RECEPTORS / RESOURCES

12.4.1. The following sensitive receptors have been identified and will be considered within the environmental impact assessment:

- Construction workers (medium sensitivity);
- Future Site users (medium sensitivity);
- Third party neighbours (medium to high sensitivity);
- Groundwater – Secondary A Aquifers and Principal Aquifer (medium to high sensitivity); and,
- Surface water features – field drains and the River Ouse (medium to high sensitivity).

12.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

12.5.1. It is anticipated that the appropriate Mitigation Measures (e.g. materials management, suitable storage of fuels) during construction would be secured via the Construction Environmental Management Plan (CEMP).

12.5.2. In addition, the following are anticipated to address both construction and operational effects:

- Ground investigation and related contamination risk assessments;
- Remediation strategy (if required);
- Remediation (if required);
- Validation of remediation (if required); and
- Permanent controlled drainage associated with the Proposed Scheme.

12.5.3. Following assessment, any additional Mitigation Measures will be identified in the ES where necessary, to reduce the magnitude of impacts.

12.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION PHASE

12.6.1. The likely significant effects associated with the Construction Phase will relate to:

- Effect on construction workers from contamination within the underlying soils/groundwater (if present);
- Effect on third-party neighbours from contamination within the underlying soils/groundwater (if present) during construction activities; and
- Effect to Controlled Waters during construction activities.

INSIGNIFICANT EFFECTS

12.6.2. Any contaminants identified during the Construction Phase will be remediated in line with the proposed uses. Clean cover layers (and any imported material), if required, will be validated for depth and chemical quality prior to the Proposed Scheme becoming operational. This negates the requirement for consideration of potential impacts to future users, third party neighbours, potable water supply and plants to contamination during the Operational Phase of the Proposed Scheme. Therefore, the potential exposure of future users, third party neighbours, potable water supply and plants to contamination during the Operational Phase will be insignificant and will not be assessed in the ES.

12.6.3. The Ground Conditions ES chapter will assess the potential effects from chemical contamination on Controlled Waters. Potential effects relating to physical contamination (i.e. sediment) and changes to groundwater flow and conveyance will be considered within Chapter 13 (Water Environment).

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

12.6.4. The impacts scoped in or out for ground conditions are as follows:

Table 12.1 – Ground Conditions – Impacts Scoped In or Out of Further Assessment

Impact	Phase	Scoped In	Scoped Out	Justification
Effect on construction workers from potential contamination within the underlying soils / groundwater (if present)	Construction	Y		Direct contact with contaminants during ground works or from the migration of contaminated dust / fibres. Inhalation of ground gases / vapours within building spaces or excavations.
Impact on third party neighbours from potential contamination within the underlying soils / groundwater (if present) during construction activities	Construction	Y		Direct contact with contaminants during ground works or from the migration of contaminated dust / fibres. Inhalation of ground gases / vapours within building spaces.
Impact to Controlled Waters during construction activities	Construction	Y		Potential for increased mobilisation of chemical contaminants. Potential for presence and migration of contaminated groundwater which may impact offsite groundwater and surface waters.
Impacts to future users, third party neighbours, potable water supply and plants from	Operational		Y	Contaminants found during the Construction Phase will be remediated in line with proposed uses. Clean cover layers and imported materials, if required, will be validated for depth and chemical quality prior to use of the Proposed Scheme. This

Impact	Phase	Scoped In	Scoped Out	Justification
contamination within the underlying soils / groundwater.				negates the requirement for consideration of future site users, third party neighbours, potable water supply and plants. An operation management plan will be in place during the operation of the Carbon Capture Plant which will put measures in place to prevent impact to Controlled Waters.

12.7. PROPOSED ASSESSMENT METHODOLOGY

LEGISLATIVE CONTEXT

12.7.1. The following legislative frameworks considered applicable to the assessment of ground conditions are as follows:

- Part 2A of the Environmental Protection Act (EPA) (UK G. , Part 2A of the Environmental Protection Act., 1990);
- Environment Act, 1995 (UK G. , Environment Act. Available at: https://www.legislation.gov.uk/ukpga/1995/25/pdfs/ukpga_19950025_en.pdf, 1995);
- Control of Substances Hazardous to Human Health, 2002; (UK G. , Control of Substances Hazardous to Human Health. Available at: http://www.legislation.gov.uk/uksi/2002/2677/pdfs/uksi_20022677_en.pdf, 2002);
- Dangerous Substances Directive (Amendment), (Official Journal of the European Union, 2006);
- Groundwater Directive 2006/118/EC (Official Journal of the European Union, 2006);
- Control of Asbestos Regulations, 2012 (Statutory Instruments, 2012);
- National Planning Policy Framework (UK G. , 2019);
- Contaminated Land (England) (Amendment) Regulations (Statutory Instruments, 2012);
- Construction (Design & Management) Regulations (Statutory Instrument, 2015);
- Environmental Damage (Prevention and Remediation) Regulations (Statutory Instruments, 2015);
- The Environmental Permitting (England and Wales) Regulations (Statutory Instruments, 2016) and,
- The Water Environment (Water Framework Directive) (England and Wales) Regulations, (2000/60/EC) (Statutory Instruments, 2017).

GUIDANCE

12.7.2. The assessment will take in to account the following guidance:

- BS8576 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (British Standards Institute , 2013);
- C552 Contaminated Land Risk Assessment. A Guide to Good Practice (Construction Industry Research and Information Association (CIRIA), 2001);
- CIRIA C532 (2001) Control of Pollution from Construction Sites (Masters-Williams, 2001);

- Environment Agency (2020) Land Contamination Risk Management (LCRM) (Environment Agency, 2020);
- CIRIA C665 (2007) Assessing Risks Posed by Hazardous Gases to Buildings (Wilson, 2007);
- CIRIA C681 (2009) Unexploded Ordnance - A Guide for the Construction Industry (Stone, 2009);
- CIRIA C682 (2009) The VOCs Handbook (Baker, 2009);
- Department for Environment Food & Rural Affairs (DEFRA) (2012) Contaminated Land Statutory Guidance (Department for Environment Food & Rural Affairs, 1990);
- CIRIA C733 (2014) Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks (Nathanail, 2014);
- BS 5930:2015+A1 (2020) Code of Practice for ground investigations (British Standards Institute, 2020)
- BS 8485: 2015+A1 (2019) Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings (British Standards Institute, 2019);
- BS 10175:2011+A2 (2017) Investigation of Potentially Contaminated Sites – Code of Practice (British Standards Institute , 2017); and,
- EA (2017) Groundwater Protection Technical Guidance, (Environment Agency , 2017).

ASSESSMENT METHODOLOGY

12.7.3. The EA's guidance, LCRM (Environment Agency, 2020), advocates the use of a conceptual risk model (Conceptual Site Model (CSM)). The basis of this approach comprises three elements: a source, a pathway and a receptor. Without each of these, there can be no contamination risk. Therefore, the presence of measurable concentrations of contaminants within the ground and subsurface does not automatically imply that a contamination risk exists, since the contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors that are relevant to a particular site will vary according to the intended use of the site, its characteristics and its surroundings. The potential for harm to occur requires three conditions to be satisfied:

- The presence of substances (potential contaminants/pollutants) that may cause harm (the 'Source' of pollution);
- The presence of a receptor that may be harmed (e.g. the water environment or humans, building, fauna or flora) (the 'Receptor'); and
- The existence of a linkage between the source and receptor ('the Pathway').

12.7.4. LCRM will be used as a technical framework in the understanding of how contamination issues that may arise could be managed.

12.7.5. The CSM will be used to identify and assess the potential effects on the identified sensitive receptors (including human health, Controlled Waters, buildings and services) and outline Mitigation Measures to manage the risks identified in the assessment. The assessment will be prepared in accordance with the legislation and guidance referenced above.

12.7.6. The potential effect of the Proposed Scheme on ground conditions, and/or the effect of ground conditions on the Proposed Scheme, will be assessed for both the Construction and Operational Phases. The significance level attributed to each effect will be assessed on the magnitude of impact due to the Proposed Scheme and the value / sensitivity of the affected receptor / receiving environment to change. Magnitude of impact and the sensitivity of the affected receptor/receiving environment are both assessed on a scale of high, medium, low and negligible.

12.7.7. Table 12.2 indicates the general approach taken in assessing the sensitivity of identified receptors as part of this assessment. Negligible sensitivity has been removed, as it is deemed irrelevant as no receptor (in terms of ground conditions) is classed as negligible.

Table 12.2 – Classification of Sensitivity

Sensitivity	Criteria	Examples
High	Attribute has a high quality and / or rarity on local scale	Construction and maintenance workers (where extensive earthworks, and demolition of buildings are proposed); Groundwater aquifers currently used, or likely to be suitable for use as public potable supplies (e.g. Principal Aquifers, Source Protection Zone for a potable groundwater supply), such as the Principal Aquifer; and Controlled water bodies with national or international ecological designations.
Medium	Attribute has a medium quality and / or rarity on local scale	Construction workers (where limited earthworks, are proposed); Groundwater aquifer providing abstraction water for agricultural or industrial use (groundwater); Commercial landscaping or open space areas; and Buildings, including services and foundations.
Low	Attribute has a low quality	Construction and maintenance workers (Minimal disturbance of ground);

Sensitivity	Criteria	Examples
	and / or rarity on local scale.	Unproductive strata (groundwater) such as Made Ground; No local surface water features; and Infrastructure (roads, bridges, railways).

12.7.8. Significance criteria have been developed based on professional judgement and relevant experience. They are determined using the matrix based on magnitude of change and the sensitivity of the receptor, with the likely duration of the effect and likelihood of the effect occurring also considered when assessing each effect.

12.7.9. The sensitivities which may affect a potential receptor have been assigned based on professional judgement and experience. Factors that may affect the sensitivity of the likely receptor include:

- Age, weight, sex, duration on-site and distance from the Site. (Human receptors).
- Distance from the Site and resource potential. (Controlled Waters receptors).
- The criterion for determining magnitude of change/effect is detailed in Table 12.3.

Table 12.3 – Classification of Magnitude of Effect

Magnitude	Criteria
High	Change in soil quality or ground gas regime for a large area (>20ha) of land, sufficient to alter land use (e.g. remediation of 20ha of industrial land sufficient to enable mixed residential / commercial use). Change in groundwater conditions sufficient to change aquifer use (e.g. contamination that prevents abstraction for potable supplies, or remediation of impacted aquifer sufficient to enable potable abstractions). Generation of large volumes of non-inert waste materials for disposal off-site to landfill.
Medium	Change in soil quality or ground gas regime for a moderate area of land (<20ha) to a degree sufficient to alter land use in localised portions of the Site or to a degree requiring a change in management / Mitigation Measures for Site use.

Magnitude	Criteria
	Change in groundwater conditions that may be sufficient to change local groundwater regime and potential aquifer uses (e.g. localised contaminant impact, localised change in groundwater levels).
Low	Measurable but relatively small scale change in an area of contaminated land or ground gas regime, but insufficient to alter end land use. Change in groundwater conditions that are insufficient to change status or potential use of the water body.
Negligible	Very limited mass of contamination mobilised – just detectable. Very limited change in area of agricultural land. Very limited barely discernible change to groundwater regime.

12.7.10. Table 12.4 describes the terms that have been used to define the significance of the effects identified.

Table 12.4 – Defining Significance of Effects Criteria

Criteria	Description
Major Negative	High risk site classification – acute or severe chronic effects to human health and / or animal / plant populations predicted. Effect on a potable groundwater or surface water resource of regional importance e.g. Principal Aquifer, public water reservoir or inner protection zone of a public supply borehole
Moderate Negative	Medium risk site classification and proven (or likely significant) pollutant linkages with human health and / or animal / plant populations, with harm from long-term exposure. Effect on a potable groundwater or surface water resource at a local level e.g. effect on an outer groundwater Source Protection Zone. Temporary alteration to the regional hydrological or hydrogeological regime or permanent alteration to the local regime.
Minor Negative	Medium risk site classification and potential pollutant linkages with human health and / or animal / plant populations identified. Reversible, localised reduction in the quality of groundwater or surface water resources used for commercial or industrial abstractions, Secondary Aquifer, etc.

Criteria	Description
Negligible/Neutral	Low risk site classification – no appreciable effect on human, animal or plant health, potable groundwater or surface water resources.
Minor Positive	Risks to human, animal or plant health are reduced to acceptable levels. Local scale improvement to the quality of groundwater or surface water resources used for commercial or industrial abstraction.
Moderate Positive	Significant reduction in risks to human, animal or plant health, to acceptable levels. Significant local improvement to the quality of potable groundwater or surface water resources. Significant improvement to the quality of groundwater or surface water resources used for public water supply.
Major Positive	Major reduction in risks to human, animal or plant health. Significant regional scale improvement to the quality of potable groundwater or surface water resources

12.7.11. The terms presented in Table 12.5 will be used to define the significance of the effects. Where a range has been provided, professional judgement will be used to define the significance. The impacts will be described as positive or negative. An effect would be considered to be significant if assessed as moderate or above.

Table 12.5 – Significance of Potential Effects

Importance of Receptor	Magnitude of Impact			
	Negligible	Low	Medium	High
High	Neutral	Minor/ Moderate	Moderate/ Major	Major
Medium	Neutral	Minor	Moderate	Major
Low	Neutral	Neutral	Minor	Minor/ Moderate

12.7.12. The assessment of environmental impacts relating to ground conditions will comprise:

- Short and medium term, temporary effects; and
- Long term, permanent effects.

12.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

12.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment will rely on available data, and reasonable endeavours will be made to ensure that the data is accurate and up to date, however the accuracy of third-party information cannot be confirmed; and
- Assessments will be limited by availability of design information, specifically in relation to below ground structures (i.e. depth of piles/foundations, finished floor levels).

12.9. REFERENCES

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13. WATER ENVIRONMENT

13.1. INTRODUCTION

13.1.1. This chapter considers the impacts of the Proposed Scheme on the surface and groundwater environment during construction and operation, and any potential significant effects. It sets out the proposed methodology for the water environment assessment and identifies those impacts that can be scoped out of the EIA.

13.2. BASELINE CONDITIONS

13.2.1. Information on the baseline conditions pertaining to surface water, groundwater and flood risk was obtained from the following sources:

- Environment Agency's (EA) Long Term Risk of Flooding (Environment Agency, 2020);
- EA Flood Map for Planning (Environment Agency, 2020);
- British Geological Society's (BGS) Geology of Britain Viewer (British Geological Society, 2020);
- Natural England's MAGIC online mapping (Natural England, 2020);
- Cranfield Soil and Agrifood Institute Soilscapes online mapping (Cranfield Soil and Agrifood Institute, 2020);
- EA Catchment Data Explorer (Environment Agency, 2020);
- Drax Repower ES (WSP, 2018)
- Drax Repower consultation with:
  - EA - consultation carried out between January and May 2018;
  - Selby Area Internal Drainage Board (IDB) - consultation undertaken between December and February 2018;
  - Selby District Council (SDC) – consultation carried out between January and February 2018;
  - North Yorkshire County Council (NYCC) – consultation carried out in November 2018; and
  - Canal and River Trust – consultation carried out in February 2018.

SURFACE WATER FEATURES

13.2.2. A review of the Ordnance Survey (OS) mapping indicates five ponds and approximately 20 ordinary watercourses or field drains located within 0.5 km of the Site Boundary. All identified watercourses are classified as ordinary watercourses under the jurisdiction of the Selby Area IDB. Some of the ordinary watercourses have been identified to be suitable for commuting and foraging by otters and water voles, or the presence of otters has been recorded.

13.2.3. The Carr Dyke flows through the Site in an approximate south-west to north-east direction. It is monitored in accordance with the objectives of the Water Framework Directive (WFD). The stretch crossing the area of the Proposed Scheme (Carr Dyke to River Ouse) has a current overall status of moderate, with failing chemical status and moderate ecological status (WFD River Waterbody Catchments Cycle 2) (Environment Agency, 2019).

13.2.4. The River Ouse is located approximately 1.1 km and 1.7 km to the north and east of Drax Power Station respectively and is designated a main river under the jurisdiction of the EA. The Existing Drax Jetty is located on the bank of the River Ouse. The quality of the River Ouse is monitored in accordance with the objectives of the WFD. The stretch closest to the Study Area (River Ouse from River Wharfe to Upper Humber) has a current (Cycle 2, 2019) overall status of moderate, with failing chemical status and moderate ecological status.

13.2.5. Approximately 3.5 km downstream of the Site, the River Ouse forms part of the Humber Estuary Ramsar site, Special Area of Conservation (SAC), Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI). Natural England undertook an assessment of the SSSI in 2017, which determined the unit to be of variable condition. The section closest to the Proposed Scheme was described as 'Unfavourable – Recovering'.

13.2.6. The River Derwent SSSI and SAC is located over 1 km upstream of the Site and therefore it is unlikely to be affected by the Proposed Scheme. These sites will therefore not be considered within the water environment assessment.

GEOLOGY AND HYDROGEOLOGY

13.2.7. The Proposed Scheme is underlain by bedrock consisting of Sandstone (Sherwood Sandstone Group), which is designated as a Principal Aquifer by the EA and deemed capable of supporting water supplies at a regional scale.

13.2.8. The majority of the Proposed Scheme is underlain by the Hemingbrough Glaciolacustrine Formation (Unproductive) with pockets of Breighton Sand Formation (Secondary A Aquifer). The areas adjacent to the River Ouse are underlain by Alluvium (Secondary A Aquifer). The EA defines Secondary A Aquifers as 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. Unproductive strata are defined by the EA as having low permeability with negligible significance for water supply or river base flow.

13.2.9. The EA's Groundwater Source Protection Zone (SPZ) mapping shows that the vast majority of the Drax Power Station, southern part of the proposed laydown area, Carr Lane and western section of Redhouse Lane are located in Zone 3 of the groundwater SPZ. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. SPZs are typically used to protect abstractions for public water supply. The northern part of the Drax Power Station site, including the area of

the existing ‘woodyard’ laydown area, the northern section of the proposed laydown area and the area of the Existing Drax Jetty are not located in the groundwater SPZ.

13.2.10. As part of Drax Repower DCO application, Selby Area IDB advised that high groundwater levels occur in the area of the Proposed Scheme.

13.2.11. A review of Soilscapes mapping (Cranfield Soil and Agrifood Institute, 2020) shows that the area of the Proposed Scheme is underlain by slowly permeable and seasonally wet loamy and clayey soils.

13.2.12. The groundwater vulnerability map supplied by DEFRA shows the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a single square kilometre. The groundwater vulnerability map indicates that Drax Power Station has ‘low’ to ‘medium’ vulnerability whilst the areas which are underlain by Alluvium superficial deposits, i.e. north of the Proposed Scheme and the Existing Drax Jetty have ‘medium – high’ vulnerability.

13.2.13. There are two onsite abstraction boreholes (approximate National Grid Reference (NGR): SE 65257 27321) approximately. 0.20 km to the west of the Site Boundary. These boreholes are shown to have an active licence as recent as 2017 according to an Envirocheck report featured in the Drax Repower ES (WSP, 2018); however, it is unknown whether these boreholes are currently active. Groundwater elevation contour maps (Dames and Moore, 2000) indicate that the elevation of groundwater bedrock decreases towards the point of abstraction, as a result, the groundwater within the bedrock is flowing towards the abstraction boreholes.

13.2.14. An EA data request to determine any nearby licensed and unlicensed groundwater abstractions will be completed as part of the EIA process.

13.2.15. The Proposed Scheme is underlain by the ‘Wharfe & Lower Ouse Sherwood Sandstone’ (GB40401G702400) groundwater waterbody as shown on the Data Catchment Explorer interactive webtool (Environment Agency, 2020). The groundwater body applies to the bedrock deposits beneath the intended site. The River Basin Management Plan (RBMP) classifications and updated objectives, as defined by the WFD, of the waterbody are presented in Table 13.1.

Table 13.1 – WFD information for the ‘Wharfe & Lower Ouse Sherwood Sandstone’ Groundwater Body

Waterbody ID	**GB40401G702400**	**Waterbody Name**	**Wharfe & Lower Ouse Sherwood Sandstone**
Waterbody Type	Groundwater Body	Groundwater Area	397.205 km2

Waterbody ID	GB40401G702400	Waterbody Name	Wharfe & Lower Ouse Sherwood Sandstone
National Grid Ref.	SE5926935562		
Description	The groundwater waterbody underlies the entire Study Area and includes the bedrock of the Sherwood Sandstone Aquifer (Principal Aquifer)		
Overall Status	Poor 2019	Status Objective	Good 2021
Overall Quantitative Status	Good 2019	Status Objective	Good 2021
Overall Chemical Status	Poor 2019	Status Objective	Good 2021
Protected Area Designation	Nitrates Directive (G101, G108, G103 & G107), Safeguard Zone (GWSGZ0029), Drinking Water Protected Area (UKGB40401G702400).		
Reason for not achieving Good status	Reason not specified; 'sector under investigation'.		
Waterbody Measures	N/A		

EXISTING DRAINAGE

13.2.16. Surface water runoff generated within the boundary of the Drax Power Station is managed by a complex drainage system that combines gravity and pumped systems with open ditches, culverts, land drainage and lagoons. They collect, manage and convey surface water runoff to a consented outfall into Carr Dyke in the north-western part of the site. From here, Carr Dyke conveys the surface water to Lendall Drain from where it outfalls to the River Ouse via the Lendall Pumping Station.

13.2.17. Surface water runoff generated in the area between the Drax Power Station and the River Ouse is managed by system of drains which eventually discharge to the River Ouse. The drains are under the jurisdiction of the Selby Area IDB.

RISK OF FLOODING

Historical Flooding

13.2.18. There are no known records of flooding in the area of the Proposed Scheme.

Risk of Fluvial and Tidal Flooding

13.2.19. The EA's Flood Map for Planning (Environment Agency, 2020) shows that northern and southern part of the Drax Power Station, Carr Lane, Redhouse Lane and the area of the Existing Drax Jetty are located in the high-risk Flood Zone 3 benefitting from the existing flood defences on the River Ouse. Flood Zone 3 is described as land assessed as having a 1 in 100 or greater annual probability of flooding from rivers or a 1 in 200 or greater annual probability of flooding from the sea in any year. The risk of flooding in this area is dominated by the River Ouse, which is tidally influenced at this location, with minor fluvial contributions. There is a potential risk of breach of flood defences that may lead to the inundation of the Proposed Scheme.

Risk of Flooding from Surface Water

13.2.20. The EA's Flood Risk from Surface Water map shows isolated areas within the Site Boundary to be at low to high risk of flooding from surface water. Surface water flooding is likely to be associated with localised depressions where water will pond during or after prolonged rainfall events.

Risk of Flooding from Reservoirs

13.2.21. The EA's Flood Risk from Reservoir map (Environment Agency, 2020) shows that the northern and southern parts of the Drax Power Station, and the northern part of the proposed laydown area, are at risk of flooding from reservoirs.

13.3. STUDY AREA

13.3.1. The surface water Study Area will encompass surface water features up to a minimum of 0.5 km from the Proposed Scheme for the assessment of Direct Effects (i.e. associated with overland migration of pollutants directly to a surface feature and works within a river channel). Features that are further than 0.5 km from the Proposed Scheme but are in hydraulic connectivity with the Study Area will also be considered, including surface water abstractions and downstream watercourses. Based on the professional judgement of the assessor and current knowledge of the area, features located approximately 1 km from the Proposed Scheme will be considered. This distance is considered appropriate for the assessment of Indirect Effects, although if sensitive features located further than 1 km from the Proposed Scheme are identified to be at risk, these features will also be considered within this assessment.

13.3.2. The flood risk Study Area is dependent on the extent of the change to flood risk and the sensitivity of potential Receptors. A study area of approximately 1 km

from the Proposed Scheme is considered appropriate, although the Study Area will ultimately be informed by the magnitude of identified impacts.

13.3.3. The groundwater Study Area for impacts to groundwater resources includes features up to 1 km from the Proposed Scheme. The importance of groundwater Receptors at distances greater than 1 km from the Proposed Scheme will be considered with regard to the connectivity to features within the Study Area. Receptors considered to be of high importance will be included in the Study Area. These features may include groundwater abstractions (public and private), local and regional aquifers. The Study Area distance is considered appropriate for the assessment of Indirect Effects.

13.4. SENSITIVE RECEPTORS / RESOURCES

13.4.1. The identified sensitive Receptors that will be considered within the environmental impact assessment are summarised in Table 13.2. The sensitivity of the Receptors was determined based on the methodology set out in Table 13.4 of this chapter. Further details of the assessment methodology are provided in Section 13.6.

Table 13.2 – Sensitive Receptors

Receptor	Sensitivity
The River Ouse	Very High
The Humber Estuary SSSI / SPA / SAC / Ramsar	Very High
Carr Dyke and ordinary watercourses with high ecological value	High
Other ordinary watercourses and drains with low flow and low ecological value	Low
Wharfe & Lower Ouse Sherwood Sandstone Aquifer (Principal Aquifer)	High
Alluvium Superficial deposits aquifer (Secondary A Aquifer)	Medium
People and properties in the surrounding area	High
Drax Power Station and employees	Very High
Navigation in the River Ouse	High

13.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

13.5.1. The following design and Mitigation Measures will be applied for water resources:

Upgraded Drax Jetty

- Construction time will be minimised as far as practical;
- Best practice construction / dredging techniques will be used;
- The design of the Upgraded Drax Jetty will minimise works in the river channel as far as practical; and
- Appropriate pollution prevention measures will be applied during all construction activities.

Modification Works to Carr Lane and Redhouse Lane

- Appropriate pollution prevention measures will be applied during all construction activities;
- Watercourses will be diverted if required to ensure no loss of their existing capacity; and
- Surface water runoff generated in the new impermeable areas will be managed via appropriate drainage systems and attenuated in accordance with the requirements of the IDB and EA.

Carbon Capture Plant

- Appropriate pollution prevention measures will be applied during all construction activities;
- Appropriate construction techniques will be used to minimise potential impact on the groundwater resources;
- The vast majority of the area of the Drax Power Station is hard surfaced and it is unlikely that construction of the Carbon Capture Plant will significantly increase the amount of hard surfaced area within the boundary of the power station. At this stage, it is assumed that the existing drainage systems serving the site can be utilised. Appropriate amendments to the existing drainage systems and attenuation storage will be provided if required to mitigate increased flood risk; and
- Construction of the Carbon Capture Plant may reduce the existing floodplain storage. Hydraulic modelling of the proposed structures will be carried if required to support the design to ensure that the proposed works will not increase the risk of flooding elsewhere. The need and scope for hydraulic modelling of the proposed works will be discussed with the EA.

PROPOSED SCHEME

13.5.2. The works are located within an area that may be at risk following a breach of the River Ouse flood defences. Mitigation Measures may need to be included

in the design and operation of the Proposed Scheme to appropriately mitigate this risk, noting that this may include review of appropriate building threshold levels or emergency response procedures.

13.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

13.6.1. The impacts scoped in or out for the Water Environment assessment are as follows:

Table 13.3 - Water Environment – Impacts Scoped in or Out of Further Assessment

Impact	Phase	Scoped In	Scoped Out	Justification
Quality of surface water resources	Construction	Y		Construction works have potential to impact the quality of the surface water resources from increased pollution risk. Methodology of construction and details of the proposed works are uncertain at this stage.
Biological, physico-chemical and hydromorphological quality of ordinary watercourses along Carr Lane and Redhouse Lane	Construction Operation	Y		Modification works to Carr Lane and Redhouse Lane have the potential to temporarily or permanently impact the biological, physico-chemical and hydromorphological quality of the watercourses located along these lanes.
Biological, physico-chemical and hydromorphological quality elements of the River Ouse	Construction Operation	Y		Improvement works to the Existing Drax Jetty, including dredging of the river channel, have a potential to impact biological, physico-chemical and hydromorphological quality elements of the River Ouse.
Flood risk to adjacent Receptors and Drax Power Station	Construction Operation	Y		Construction of the Proposed Scheme may temporarily or permanently reduce the capacity of the existing floodplain storage and / or impact the existing flood flows.

Impact	Phase	Scoped In	Scoped Out	Justification
Flood risk to adjacent Receptors and Drax Power Station	Operation			Construction of the Proposed Scheme has the potential to increase the rate and volume of surface water runoff generated in the area that may increase the risk of flooding in the area or elsewhere.
Capacity of ordinary watercourses along Carr Lane and Redhouse Lane	Construction Operation	Y		Modification works to Carr Lane and Redhouse Lane have the potential to temporarily or permanently impact the capacity of the watercourses located along these lanes.
Impacts to groundwater associated users	Construction Operation	Y		Local abstractions below <20m^3/d are not currently known. This would be assessed during EIA.
Quality of groundwater resources	Construction	Y		Construction works have potential to impact the quality of the groundwater resources from increased pollution risk. Methodology of construction and details of the proposed works are uncertain at this stage.
Groundwater vulnerability	Construction Operation	Y		Soil stripping and excavation that may remove or reduce the protective layers overlying aquifers increases the vulnerability of the aquifer to surface contaminant sources. Piling may also provide a pollution pathway which could increase groundwater vulnerability.
Groundwater flooding risks	Construction Operation	Y		Below ground structures (piles / foundations) have the potential to create a groundwater flow barrier resulting in groundwater level rise and potentially groundwater flooding.

Impact	Phase	Scoped In	Scoped Out	Justification
Groundwater rebound	Construction Operation	Y		Groundwater levels may rise if pumping at abstraction boreholes is discontinued; which could increase the risk of groundwater flooding.

13.7. PROPOSED ASSESSMENT METHODOLOGY

13.7.1. The assessment will be undertaken following the principles of EIA as set out within the Design Manual for Roads and Bridges (DMRB) LA 113 – Road Drainage and the Water Environment[7]. Although not directly applicable to the nature of the Proposed Scheme, the DMRB guidance provides a good basis for assessing effects of schemes on the water environment. The DMRB promotes the following approach:

- Estimation of the importance of the attribute (Table 13.4). The importance of the feature or resource is based on the value and sensitivity of the feature or resource;
- Estimation of the magnitude of the impact (Table 13.5). The magnitude of an impact is estimated based on the potential size or scale of change compared to the baseline and is independent to the importance of the attribute; and
- Assessment of the significance of the effect (Table 13.6). The overall significance of the effect is based on the importance of the attribute (Table 13.4) and the magnitude of the impact (Table 13.5).

13.7.2. The basic approach to assessing the impacts of the Proposed Scheme is to consider how sensitive the Receptors may be to changes in surface water or groundwater conditions, including flows and water quality, and flood risk. The indicators used in making a professional judgement on the importance of a water feature under consideration include quality, scale, rarity and substitutability where:

- Quality is a measure of the physical condition of the attribute;
- Scale requires consideration of the geographical extent to which an attribute matters to both policy makers and stakeholders;
- Rarity requires consideration of whether the water feature is commonplace or scarce and the scale at which it matters; and
- Substitutability requires consideration of whether water attributes are replaceable over a given time frame.

13.7.3. The assessment will consider the likely significant effects of the Proposed Scheme on the chemical, ecological, hydromorphological of surface water features within the Study Area, and the chemical quality, flow and levels of groundwater features within the Study Area. A WFD Screening assessment will be prepared to support the EIA. It will assess potential impacts of the proposed works on WFD status of the groundwater resources, the River Ouse, Carr Dyke and potentially the Humber Estuary.

[7] Design Manual for Roads and Bridges LA 113 Road Drainage and the Water Environment, Revision 1, March 2020

13.7.4. The assessment will also consider the likely significant effects of the Proposed Scheme on flood risk from all sources to people and property elsewhere, as well as the risk of flooding to the Proposed Scheme. A standalone Flood Risk Assessment (FRA) will be prepared to support the EIA.

13.7.5. The assessment of potential effects as a result of the Proposed Scheme will take into account both the construction and operational phases.

Table 13.4 – Estimating the Importance of Water Environment Receptors

Importance	Criteria	Example	
Very High	Nationally significant attribute of high importance	Surface water	Watercourse having a WFD classification shown in a RBMP and Q95 ≥ 1. 0 m3/s. Site protected / designated under EC or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water) / Species protected by EC legislation.
		Groundwater	Principal aquifer providing a regionally important resource and / or supporting a site protected under EC and UK Legislation. Groundwater locally supports Groundwater Dependent Terrestrial Ecosystem (GWDTE). SPZ 1
		Flood Risk	Essential infrastructure or highly vulnerable development.
High	Locally significant attribute of high importance	Surface water	Watercourse having a WFD classification shown in a RBMP and Q95 <1.0 m3/s. Species protected under EC or UK legislation.
		Groundwater	Principal aquifer providing locally important resource or supporting a river ecosystem. Groundwater supports GWDTE.

Importance	Criteria	Example	
			SPZ 2.
		Flood risk	More vulnerable development.
Medium	Of moderate quality and rarity	Surface water	Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001 m3/s.
		Groundwater	Aquifer providing water for agricultural or industrial use with limited connection to surface water. SPZ 3.
		Flood risk	Less vulnerable development.
Low	Lower quality	Surface water	Watercourses not having a WFD classification shown in a RBMP and Q95 ≤0.001 m3/s.
		Groundwater	Unproductive strata.
		Flood risk	Water compatible development.

Table 13.5 – Criteria for Assessing the Potential Magnitude of an Impact

Magnitude	Criteria	Example
Major Adverse	Results in loss of attribute and / or quality and integrity of the attribute	Surface water • Loss or extensive change to a fishery. • Loss of regionally important public water supply. • Loss or extensive change to a designated nature conservation site. • Reduction in water body WFD classification Groundwater

Magnitude	Criteria	Example
		• Loss of, or extensive change to, an aquifer. • Loss of regionally important water supply. • Potential high risk of pollution to groundwater from routine runoff. • Loss of, or extensive change to GWDTE or baseflow contribution to protected surface water bodies. • Reduction in water body WFD classification. • Loss or significant damage to major structures through subsidence or similar effects. Flood Risk • Increase in peak flood level (> 100 mm).
Moderate Adverse	Affects integrity of attribute, or loss of part of attribute	Surface water • Partial loss in productivity of a fishery. • Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. Contribution to reduction in water body WFD classification. Groundwater • Partial loss or change to an aquifer. • Degradation of regionally important public water supply or loss of significant commercial/ industrial/ agricultural supplies. Potential medium risk of pollution to groundwater from routine runoff. • Partial loss of the integrity of GWDTE. • Contribution to reduction in water body WFD classification. • Damage to major structures through subsidence or similar effects or loss of minor structures.

Magnitude	Criteria	Example
		Flood Risk • Increase in peak flood level (> 50mm).
Minor Adverse	Results in some measurable change in attribute's quality or vulnerability	Surface water • Minor effects on water supplies. Groundwater • Potential low risk of pollution to groundwater from routine runoff. • Minor effects on an aquifer, GWDTEs, abstractions and structures. Flood Risk • Increase in peak flood level (> 10 mm).
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use of integrity	Surface water • No risk identified to water supplies. Groundwater • No measurable impact upon an aquifer and/or groundwater. Flood Risk • Negligible change to peak flood level (≤ +/- 10 mm).

13.7.6. The following terms have been used to define the significance of the effects identified:

- Major effect: where the Proposed Scheme could be expected to have a very significant effect (either positive or negative) on Receptors.
- Moderate effect: where the Proposed Scheme could be expected to have a noticeable effect (either positive or negative) on Receptors.
- Minor effect: where the Proposed Scheme could be expected to result in a small, barely noticeable effect (either positive or negative) on Receptors.
- Negligible: where no discernible effect is expected as a result of the Proposed Scheme on Receptors.

13.7.7. The overall significance of effects considered both the magnitude of the impact against the sensitivity of the Receptor, as demonstrated in Table 3.1 of the EIA Methodology Section of this report.

13.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

13.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- Methodology of the construction and details of the proposed works, particularly for the Upgraded Drax Jetty, are uncertain at this stage;
- At this stage it is not proposed to undertake hydraulic modelling to inform the assessment of flood risk to the Proposed Scheme or elsewhere as a result of the Proposed Scheme. The need for hydraulic modelling will be discussed with the EA;
- The need for the WFD will be determined once details of the proposed works and construction methodology are available. If required, scope for a WFD assessment will be discussed with the EA;
- It has been assumed that the abstraction boreholes (approximate NGR: SE 65257 27321) located approximately 0.20 km to the west of the Site Boundary are currently in operation;
- It is not proposed to undertake water quality sampling to inform the assessment of the impacts of the Proposed Scheme on the quality of the water features nearby.

13.9. REFERENCES

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14. MATERIALS AND WASTE

14.1. INTRODUCTION

14.1.1. This chapter considers the potential impacts of the Proposed Scheme from the consumption of materials and generation and disposal of waste. It considers those impacts during construction and operation, and any potential significant adverse environmental effects. It sets out the proposed methodology for the materials and waste assessment and identifies those impacts that can be scoped out of the Environmental Impact Assessment (EIA).

14.2. BASELINE CONDITIONS

14.2.1. This section describes Baseline material consumption and waste disposal for the current assets and land use within the Site Boundary and provides regional / national information and data in the context of which environmental assessment can be undertaken.

14.2.2. The most up to date sources of information have been used to collate data for material resource availability, landfill capacity and waste recovery. Indication of the most recent year from which data has been acquired is provided throughout. The Baseline data collected and presented in this chapter were obtained by desk study, from publicly available data sources, as follows:

- Department for Business, Energy & Industrial Strategy (2020) Monthly Bulletin of Building Materials and Components;
- Yorkshire and Humber Aggregates Working Party Annual Aggregates Monitoring Report 2017;
- Mineral Products Association, Profile of the UK Mineral Products Industry, 2018 Edition;
- United Kingdom Steel Production I 1969-2020 Data I 2021-2022 Forecast I Historical (Online);
- North Yorkshire Minerals and Waste Joint Plan – Publication Draft 2016 (Adopted March 2018);
- North Yorkshire Minerals and Waste Joint Plan Interactive Policies Map
- Natural England MAGIC mapping website;
- DEFRA, Basis of the UK BAP target for the reduction in use of peat in horticulture – SP0573 (2009);
- Defra (2019) UK Statistics on Waste;
- Directive 2008/98/EC of the European parliament and of the council of 19 November 2008 on waste and repealing certain directives. The European Parliament and the Council of the European Union (2008);
- Environment Agency, Waste Data Interrogator (2019) Waste Management Information 2019: Yorkshire and the Humber;

- Environment Agency, Waste Data Interrogator (2019) Waste Management Information 2019: England; and
- Environment Agency, Remaining landfill capacity, England – Version 2 (2018).

MATERIALS CURRENTLY REQUIRED

14.2.3. An overview of the materials likely to be needed to operate and maintain the current assets within the Site Boundary is required to assist in determining the Baseline. The current assets incorporate the existing plant, buildings and ancillary infrastructure as well as the access roads around the Site and the public roads leading to the Drax Jetty on the River Ouse.

14.2.4. The operation and maintenance of these assets will require a number of minor products e.g. lighting, paint, fencing, as well as the intermittent use of bulk products for routine works and repairs of the existing buildings, plant, ancillary infrastructure and highways (e.g. concrete, masonry, aggregate and asphalt for minor re-surfacing).

14.2.5. Although no data is currently available, professional judgement can be used to assert that by comparison with regional and national availability of resources, consumption of construction and other routine materials within the Site Boundary will be minimal.

14.2.6. Table 14.1 provides a summary of the availability of the main construction materials in Yorkshire and the Humber region (Humberside, North Yorkshire, South Yorkshire and West Yorkshire) and the UK, as required to deliver buildings, plant and highways. The overview excludes technological products but provides a context in which the assessment of impacts and significant effects from material consumption from the Proposed Scheme can be undertaken.

Table 14.1 – Construction materials availability in Yorkshire and the Humber region and the UK

Material Type	Yorkshire and the Humber	UK
Sand and gravel *	1.9 million tonnes (Mt)	58.5 Mt
Permitted crushed rock *	10.9 Mt (2017)	144.5 Mt (2017)
Concrete blocks #	3.5 million square metres (Mm^2) (North)	9.1 Mm^2
Primary aggregate *	14.4Mt (2016)	203Mt (2017)
Recycled and secondary aggregate + | *	5.5Mt (2017)	70.4Mt (2017)
Ready-mix concrete *	1.2 million cubic metres (Mm^3) (2017)	25.9Mm^3 (2017)
Steel +	(no data)	7.2 Mt
Asphalt *	2.1Mt (2017)	22.7 Mt (2017)

Material Type	Yorkshire and the Humber	UK
# stocks + production * sales Data availability: 2019 unless otherwise stated (Department for Business, Energy & Industrial Strategy, 2020) (Mineral Products Association, 2018) (United Kingdom Steel Production, 2020) (Yorkshire and Humber Aggregate Working Party, 2017)		

14.2.7. Across the UK, the availability of materials typically required for construction schemes, indicates that stocks / production / sales remain buoyant, although information on steel production is not currently available for the region.

14.2.8. Where data are available, the Yorkshire and the Humber region has in general a higher than average availability of construction materials in comparison to other UK regions. For example, stock of concrete block and sales of recycled and secondary aggregate are amongst the highest in the UK. The availability (sales) of sand and gravel are, however, lower than the UK average.

14.2.9. The North Yorkshire Minerals and Waste Joint Plan Interactive Policies Map (North Yorkshire County Council, 2020) identifies that the majority of the Drax Power Station and the surrounding area overlie both a brick clay mineral safeguarding area (MSA) and a sand and gravel MSA. However, the mineral resources within the Site Boundary are noted to be already constrained by existing infrastructure; this will be taken into account as part of further assessments of the potential for resource sterilisation.

14.2.10. There are no known peat resources (Natural England, 2020) or active peat extractions (Department for Environment Food and Rural Affairs, 2009) within the Site Boundary.

SITE ARISINGS CURRENTLY GENERATED

14.2.11. The current land use within the Site Boundary is expected to be limited to surplus materials generated during minor repair works on existing power plant infrastructure and access roads. Some of these arisings would be expected to be diverted from landfill. Although no data exist, it is therefore anticipated (using professional judgement) that the current generation of site arisings at site is minimal.

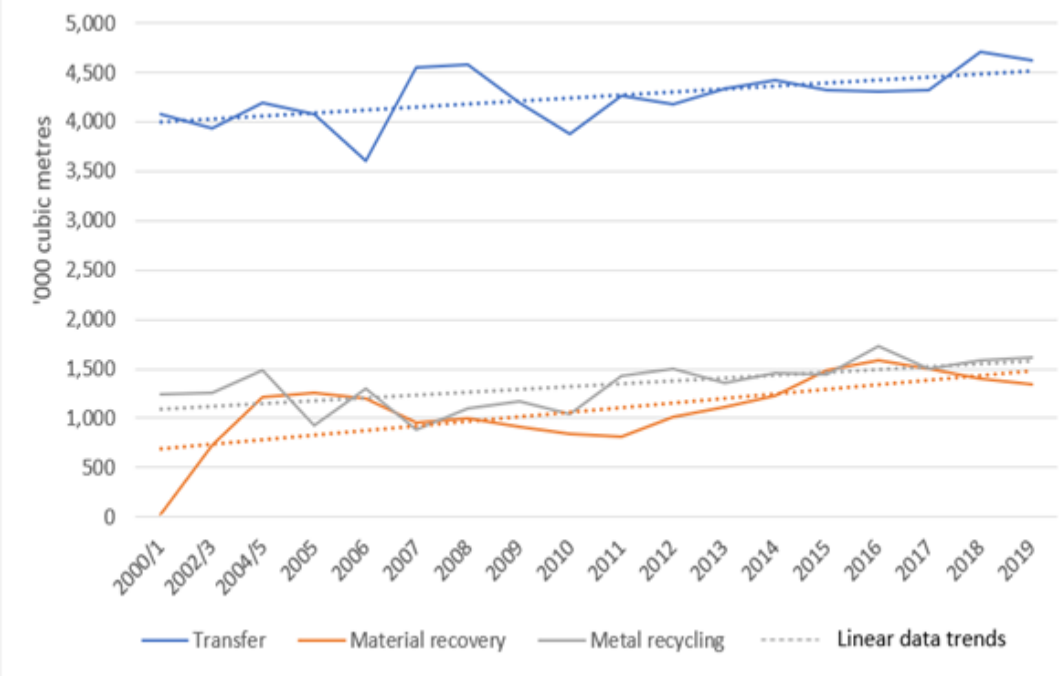
14.2.12. Defra data (Table 14.2) show that within England, the recovery rate for non-hazardous construction and demolition wastes have remained above 90% since 2010 (Department for Environment Food and Rural Affairs, 2019). This exceeds the EU target of 70% (by weight), which the UK must meet by 2020. This target excludes naturally occurring materials (specifically category 17 05 04 in the list of waste defined as non-hazardous soils and stones) (The European Parliament and the Council of the European Union, 2008).

Table 14.2 – Non-hazardous Construction and Demolition Waste Recovery in England

Year	Generation (Mt)	Recovery (Mt)	Recovery rate (%)
2010	53.6	49.4	92.2%
2011	54.9	50.8	92.5%
2012	50.5	46.4	92.0%
2013	51.7	47.6	92.0%
2014	55.9	51.7	92.4%
2015	57.7	53.3	92.3%
2016	59.6	55.0	92.1%
Note: Defra's 2019 update of the data in this table did not extend the data range beyond 2016			

14.2.13. Data in Figure 14.1 have been collated to show that trends for waste recovery in the region have risen steadily over the past 19 years (Environment Agency, 2019). Data are provided for all waste types in Yorkshire and the Humber and hence will include, but are not specific to, construction, demolition and excavation wastes.

Figure 14-1 – Transfer, materials recovery and metal recycling in Yorkshire and the Humber region (2000/1 – 2019)



14.2.14. Linear trends (shown as dashed lines on the graph) for transfer, recovery and metal recycling in Yorkshire and the Humber indicate that there is likely to be regional infrastructure and capacity for managing construction, demolition and

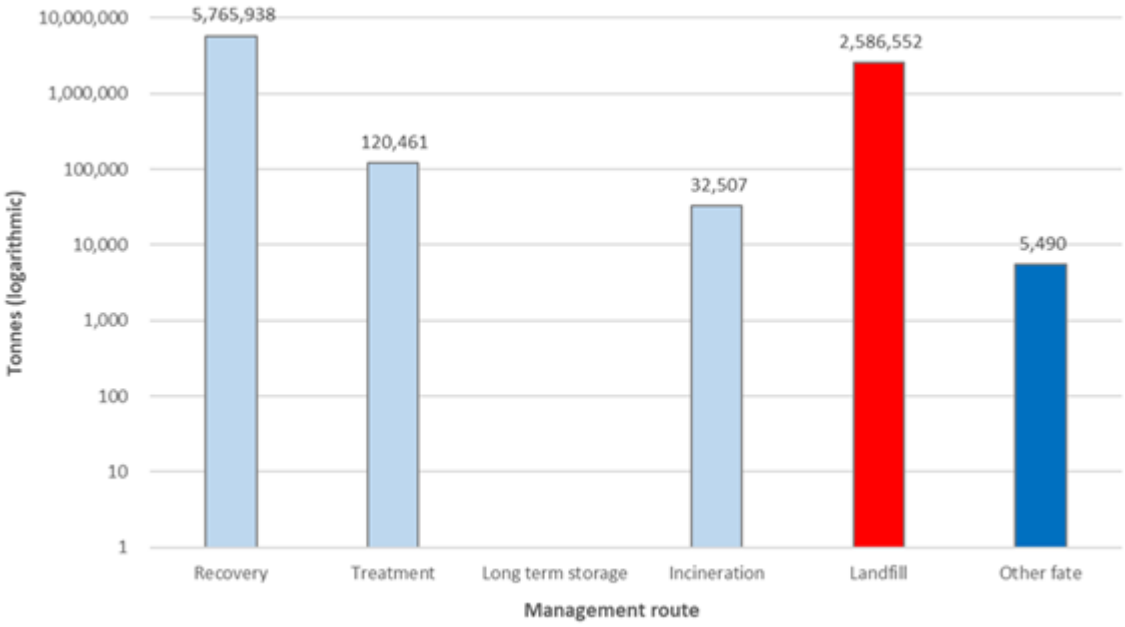
excavation wastes from the Proposed Scheme. The data in Table 14.3 confirm this assertion (Environment Agency, 2019).

Table 14.3 – Permitted Waste Recovery Sites in Yorkshire and the Humber Region (2019)

Waste recovery facility type	Number of sites
Incineration	25
Transfer	373
Treatment	363
Metal recovery	344
Use of waste	0
Total	1,105

Regional data for construction and demolition waste are presented in Figure 14.2 based on analysis of publicly available information in the Waste Data Interrogator (Environment Agency, 2019).

Figure 14-2 – Construction and Demolition Waste Management by Route for the Region



14.2.15. Data in Figure 14.2 show that the volume of waste recovered, including treatment and incineration, was more than double the volume of waste sent to landfill in the region in 2019. This is confirmed by data in Table 14.4 Table 14.4 which show that in 2019, 70% of waste received in the region was diverted from landfill through waste management and recovery methods. Data include the total waste received from both within the Yorkshire and the Humber region and from other regions in the UK.

Table 14.4 – Waste management routes for waste received in Yorkshire and the Humber (2019)

Waste Management Route	Inert and non-hazardous waste (tonnes)	Hazardous waste (tonnes)	Total waste (tonnes)	Percentage
Recovery	5,888,702	30,204	5,918,906	70%
Landfill	2,501,257	85,295	2,586,552	30%
Other fate	5,490	-	5,490	0%
Totals	8,395,449	115,499	8,510,947	100%

14.2.16. The charts and data presented in this section confirm the availability of waste management facilities in the region, that are expected – subject to data provision – to enable suitable recovery of site arisings generated by the Proposed Scheme.

14.2.17. The North Yorkshire Minerals and Waste Joint Plan (MWJP) (adopted March 2018) (North Yorkshire County Council, 2018) has identified that construction, demolition and excavation (CDE) arisings currently form a significant proportion of total waste arisings across the North Yorkshire sub-region. Projections forecast CDE arisings will reach 920,306 tonnes by 2030.

14.2.18. The MWJP raises the potential of capacity shortfalls at waste recovery facilities in relation to the MWJP timeframe (until 2030), where – if trends do not abate – additional waste management facilities will be required for CDE arisings. The MWJP identifies (through the Waste Arisings and Capacity Assessment 2016) an expected capacity gap for recycling of CDE waste of approximately 470,000 tonnes per year by 2030.

14.2.19. The MWJP sets out expectations for waste management practices, with a target of achieving (under a maximised recycling scenario) 5% or less CDE waste to landfill by 2020. Further to this, Policy W05 outlines aims to meet CDE waste capacity requirements, whilst Policy M11 encourages the management of this type of waste with an emphasis on re-use and recycling in accordance with the Waste Hierarchy. Policy W05 states that where this is not achievable, expansions to existing suitable waste recycling and treatment facility sites will be permitted subject to location and development management policies outlined in Policies W10 and W11.

14.2.20. The availability of materials recovery infrastructure in the Yorkshire and the Humber, and across England (mindful of the financial and environmental

benefits that can be achieved by applying the proximity principle), suggests that there is strong potential to divert from landfill site arisings generated by the Proposed Scheme.

WASTE CURRENTLY GENERATED AND DISPOSED

14.2.21. Waste generated for disposal to landfill from activities undertaken within the Site Boundary is expected to comprise a combination of recoverable and non-recoverable wastes from commercial and industrial activities associated with the office and welfare buildings, routine maintenance of the site plant and associated infrastructure and assets. Although no Baseline waste data is presently available for the current Site, it is anticipated (using professional judgement) that even in the worst-case scenario, the current waste generation and disposal is minimal in the context of available regional capacity. This evidence is compounded by the fact that Drax has in place existing measures for the treatment and disposal of by-products through the current operation of the plant.

REMAINING LANDFILL CAPACITY

14.2.22. Environment Agency data (Environment Agency, 2018) confirm that at the end of 2018, 40 landfill sites in Yorkshire and the Humber region were recorded as having 71.1 Mm^3 of remaining capacity as presented in Table 14.5, which also shows the change in capacity from 2017 to 2018.

Table 14.5 – Remaining Landfill Capacity in Yorkshire and the Humber (2017-2018)

Landfill type	Capacity in 2017 (m^3)	Remaining capacity in 2018 (m^3)	2017 to 2018 change in capacity (Mm^3) and percentage
Hazardous (merchant and restricted)	2,666,437	2,651,184	-0.01 (0.57%)
Inert	14,135,712	13,439,257	-0.7 (4.9%)
Non-hazardous (including stable hazardous waste cells)	59,029,412	55,036,659	-4.0 (6.8%)
Total	75,831,561	71,127,730	-4.7 (6.2%)

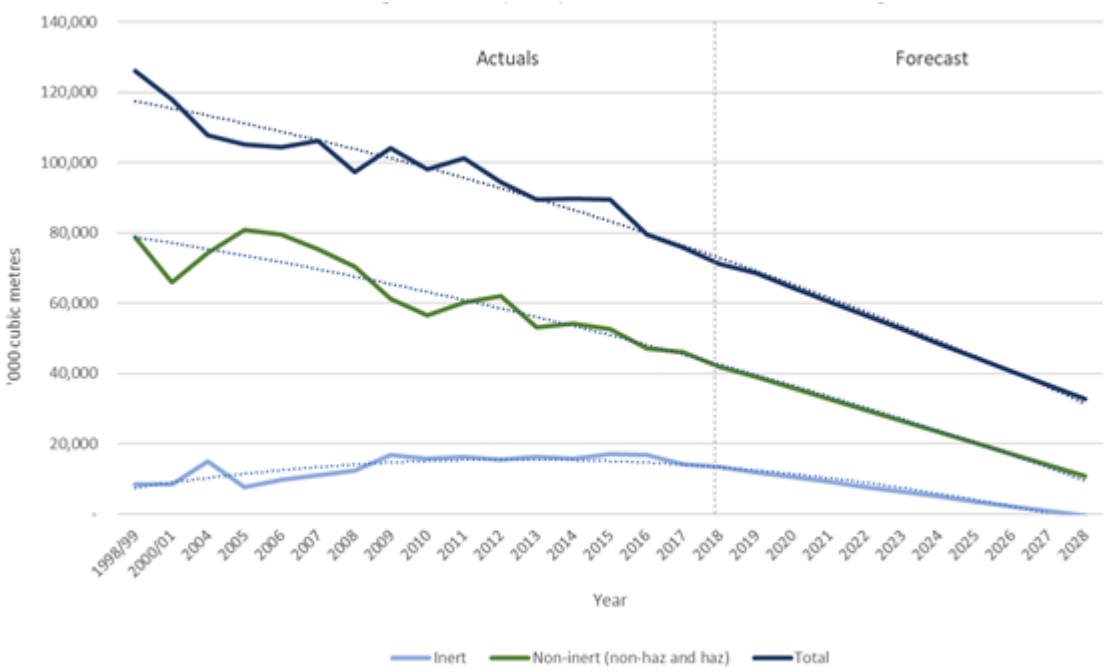
14.2.23. The MWJP has identified a (non-hazardous) landfill capacity shortfall is forecast to occur from 2022, with a maximum capacity deficit of approximately 186,000 tonnes per year by 2030 (the Plan timeframe).

14.2.24. The MWJP (Policies W01 and W05) (North Yorkshire County Council, 2018) includes proposals for the development of additional landfill sites under certain

criteria. Locations will include, but are not limited to, expansion of existing landfill sites, previously developed land and mineral extraction sites.

14.2.25. Baseline regional landfill capacity is detailed in Figure 14.3. Simple statistical forecasting (using the Microsoft Excel forecasting function) has been used to demonstrate long term void capacity to the year of Proposed Scheme completion (2028) in the absence of future provision.

Figure 14-3 – Remaining Landfill Capacity in Yorkshire and the Humber Region



14.2.26. Baseline data indicates that in the absence of future provision, inert, non-inert and total landfill capacity is likely to become an increasingly sensitive receptor throughout the duration of the construction phase and in operation. Figure 14.3 shows that in the absence of future provision, waste capacity in Yorkshire and the Humber region is forecast to reduce from 2018 to 2028 by as much as:

- Inert waste - 100%;
- Non-inert waste - 74% to 10.8 Mm^3; and
- Total waste - 54% to 32.6 Mm^3.

FUTURE BASELINE

14.2.27. In the absence of the Proposed Scheme, the current assets and land use within the Site Boundary would be expected to remain the same across the Future Baseline; this is true for both the Construction Phase and the full lifecycle of works. This assertion, in combination with the scale of current infrastructure and operations at the Site, means that the potential for the consumption of materials resources and the recovery of site arisings in the Future Baseline, remains minimal. Similarly, the potential for waste generation to landfill in the Future Baseline is also anticipated to remain very limited.

14.2.28. The possible exception to these cases is that as the existing infrastructure ages, increased maintenance and repair work may be required, and even (potentially) demolition / deconstruction activities deployed. The generation of such arisings would in most cases be expected to be temporary and hence would not contribute to long-term impacts.

14.3. STUDY AREA

The Study Areas that are applicable to the Proposed Scheme are as defined in IEMA's guide to Materials and Waste in Environmental Impact Assessment (April 2020) (IEMA, 2020): (Referred to hereafter as the IEMA guidance).

- The Development Study Area comprises the extent of the Proposed Scheme footprint and any areas required for temporary access, site compounds, working platforms and other enabling activities.
- The Expansive Study Area extends to the availability of construction materials and the capacity of waste management facilities within the UK and the Yorkshire and the Humber region of England (Humberside, North Yorkshire, South Yorkshire and West Yorkshire).

14.4. SENSITIVE RECEPTORS / RESOURCES

14.4.1. The following sensitive receptors have been identified and will be considered within the EIA:

- Material resources – consumption impacts on materials' immediate and long-term availability, and results in depletion of natural resources.
- Landfill void capacity – reductions in regional and national infrastructure result in unsustainable use or loss of resources and temporary or permanent degradation of the natural environment.

14.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

14.5.1. No specific primary mitigation measures for sustainable resource management during the construction of the Proposed Scheme have yet been committed to, although it is expected that these will be identified and adopted as the design develops.

14.5.2. Examples of potential design mitigation and enhancement measures are noted in Table 14.6, although none of these are yet formally committed to by the client.

Table 14.6 – Potential Design, Mitigation and Enhancement Measures

Element	Description	Timing / Process
Materials	Identification and specification of material resources that can be acquired responsibly, in accordance with BES 6001 Responsible Sourcing of Construction Products (BRE Group, 2016).	Design and construction
	Design for resource optimisation: simplifying layout and form; using standard sizes; balancing cut and fill; maximising the use of renewable materials and materials with recycled or secondary content; and setting net importation as a scheme goal.	Design
	Design for off-site construction: maximising the use of pre-fabricated structures and components, encouraging a process of assembly rather than construction.	Design
	Design for the future: considering how materials can be designed to be more easily adapted over an asset lifetime, and how deconstructability and demountability of elements can be maximised at end-of-first-life.	Design
	Identification of opportunities to minimise the export and import of material resources.	Design and construction

Element	Description	Timing / Process
	Manage engineering plan configurations and layouts to ensure the most effective use of materials and arisings can be achieved.	Design and construction
	As part of a Construction Environmental Management Plan (CEMP), implement a Materials Management Plan in accordance with the Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Code of Practice.	Construction
Waste	Engage early with contractors to identify possible enhancement and mitigation measures (for example, waste exemption licenses), and to identify opportunities to reduce waste through collaboration and regional synergies.	Design and Procurement
	Design for recovery and reuse: identifying, securing and using material resources at their highest value, whether they already exist on site, or are sourced from other schemes.	Design
	Ensure arisings are properly characterised before or during design, to maximise the potential for highest value reuse.	Design
	Forecast and identify the volume and type of woodland and other vegetative arisings that will be generated and establish	Design and construction

Element	Description	Timing / Process
	opportunities for high-value re-use and recycling, both on and off-site.	
	Working to a proximity principle, ensuring arisings generated are handled, stored, managed and re-used or recycled as close as possible to the point of origin.	Design and construction
	Identify areas for stockpiling and storing wastes that will minimise quality degradation and leachate and will minimise damage and loss.	Design and construction
	As part of a Construction Environmental Management Plan (CEMP), specify management requirements for waste and arisings and capture information and data on site arisings recovered and diverted from landfill, by developing a Design Site Waste Management Plan once a preferred option has been selected.	Design
	Use of existing on-site waste management processes and procedures to drive best practice behaviour and contracts, to maximise action in the highest tiers of the Waste Hierarchy and proximity principle	Operation

14.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

14.6.1. Detailed design for the Proposed Scheme is ongoing and hence waste volumes are not yet available. Therefore, in the absence of this data, the following Construction and Operational Phase effects are potentially significant:

- The consumption of large quantities of materials could have a potentially significant adverse effect on the environment through the depletion of natural resources; and
- The generation and disposal of waste from the Proposed Scheme is commensurate with a reduction in regional landfill void capacity and the loss of resources.

14.6.2. Note that by virtue of tertiary mitigation measures already adopted (Environmental Permitting, for example), the assessment of potential impacts and effects from process chemicals to be consumed during operation (for example, amine solvent, caustic soda, anti-foam and sulphuric acid) and waste generated from site by-products during operation is specifically excluded from this chapter. This assertion has been made using professional judgement, on the basis of delivering a proportionate environmental assessment process.

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

14.6.3. The impacts scoped in or out for the Materials and Waste assessment are as follows:

Table 14.7 – Materials and Waste – Impacts Scoped in or Out of Further Assessment

Impacts	Phase	Scoped In	Scoped Out	Justification
Impacts associated with the extraction of raw resources and the manufacture of products	Construction Operation		Y	The impacts and effects of extraction and manufacture of materials cannot be assured with any accuracy, and hence are scoped out of the assessment.
Consumption of material resources associated with the construction of the Proposed Scheme	Construction (including any site preparation, remediation and groundworks)	Y		Further information is required to assess the potential impacts of the Proposed Scheme on regional material resource availability and the use of site won materials and recycled/ secondary materials.
Disposal and recovery of waste associated with the construction of the Proposed Scheme	Construction (including any site preparation, remediation and groundworks)	Y		Further information is required to assess the potential impacts of the Proposed Scheme on existing waste infrastructure and landfill capacity.
Consumption of material resources associated with the Proposed Scheme during the first year of operation	Operation		Y	In the first year of operation the Proposed Scheme is not anticipated to consume material resources beyond those required for routine repair and maintenance. Also, as described in para 14.5.2, the impacts and effects from chemicals consumed as part of the processes to be adopted are excluded from further assessment as they already fall within the existing Environmental Permitting regime for the Site.

Impacts	Phase	Scoped In	Scoped Out	Justification
				As such, the impacts associated with material resource consumption are considered to be minimal and not significant.
Disposal and recovery of waste associated with the Proposed Scheme beyond the first year of operation	Operation		Y	The operation of the Proposed Scheme beyond the first year of commissioning is anticipated to generate only minimal waste arisings from routine maintenance and repairs. Also, as described in para 14.5.2, the impacts and effects from wastes generated from site by-products are excluded from further assessment as they already fall within the existing Environmental Permitting regime for the Site. As such, the impacts associated with waste generation and disposal are considered to be minimal and not significant.
Impacts resulting from the transportation of material resources and waste to and from the Proposed Scheme	Construction and Operation		Y	The impacts associated with transportation will be considered as part of the air quality, traffic and transport and noise and vibration assessments.
Impacts and effects on human health and controlled waters as a result of contaminated site arisings from the Proposed Scheme	Construction Operation		Y	Impacts and effects on human health and controlled waters will be considered in the geology and soils assessment.

LIKELY SIGNIFICANT EFFECTS

14.6.9. The potential for significant effects will be assessed based on the 'scoped in' elements set out in Table 14.7.

MATERIAL ASSETS

14.6.10. The Proposed Scheme is expected to require the consumption of primary and secondary materials for the construction of infrastructure required for:

- The Carbon Capture Plant (e.g. a new wastewater treatment plant, a potential new cooling tower to the north of the plot, additional chemical storage and distribution facilities);
- Potential construction of the Upgraded Drax Jetty to provide a new marine offloading facility incorporating security lighting, fencing, storage and welfare facilities and laydown areas; and
- Modifications to Redhouse Lane and Carr Lane between the Upgraded Drax Jetty and the Drax Power Station to facilitate road transport of Abnormal Indivisible Loads (AILs) between the two locations.

14.6.11. Whilst it is intended that core items of existing infrastructure will be reused by integrating the new Carbon Capture technology into the current power generating units, cooling water systems and main stack, primary materials will still be required for the Proposed Scheme. These materials are a finite resource, and, in the absence of confirmatory data, a current worst-case scenario has been applied that anticipates one or more materials required is >10% by volume of the regional (or where justified, national) baseline availability.

WASTE

14.6.12. Site preparation and remediation (incorporating groundworks), and excavation, demolition and other clearance works, are expected to produce arisings including but not limited to topsoil, earthworks, vegetation, asphalt, concrete, masonry, metalwork and possibly asbestos.

14.6.13. In addition, there is the potential for waste generated by the dredging of the River Ouse, required to facilitate access to the Upgraded Drax Jetty and from modifications to the access roads.

14.6.14. The exact proportion of construction and demolition arisings that will be recovered from construction activities will be assessed and refined as part of later design stages.

14.6.15. Preliminary assessment based on professional judgement indicates that there is potentially high value to be gained from recovering resources, although hazardous materials and contaminated arisings would need to be treated and / or disposed of as hazardous waste.

14.6.16. Where diverting site arisings from landfill is not possible, the impacts associated with disposing of waste would be adverse, permanent and direct.

14.6.17. After mitigation, any wastes which cannot be diverted from landfill are expected to have an adverse impact on landfill capacity in the region and would result in the significant effects, namely the generation and disposal of waste resulting in a reduction in regional landfill void capacity.

14.7. PROPOSED ASSESSMENT METHODOLOGY

14.7.1. The IEMA guidance (IEMA, 2020) will be used to assess the potential impacts and effects from the Proposed Scheme, using the process and significance criteria it sets out. It is anticipated that Method W1 (Void Capacity, as detailed in the IEMA guidance) will be used to best reflect the scale and nature of the Proposed Scheme.

14.7.2. In accordance with the IEMA guidance, the assessment will be a quantitative exercise that aims to identify the:

- Type and volume of materials to be consumed by the Proposed Scheme, including details of any recycled materials content;
- Type and volume of waste to be generated by the Proposed Scheme, with details of planned recovery and / or disposal method (for example on-site reuse, off-site recycling, disposal to landfill);
- Cut and fill balance; and
- Details of any materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.

14.7.3. The sensitivity of materials relates to the regional (and where justified, national) availability and type of resources to be consumed by the Proposed Scheme. The sensitivity of waste relates to the availability of regional (and where appropriate, national) landfill void capacity, in the absence of the Proposed Scheme and future provision.

14.7.4. The magnitude of impacts from the Proposed Scheme that will be considered in the assessment include:

- Anticipated reductions in availability (stocks, production and/or sales) of materials regionally and nationally; and
- Anticipated reductions in the landfill void capacity of regional and national infrastructure.

14.7.5. The likely types and estimated quantities of material resources required (including site arisings generated) for the Proposed Scheme will be assessed. Impacts and effects will be evaluated to regional (and where justified, national) materials availability data, where information is available.

14.7.6. Among other criteria, the assessment will consider the contribution of alternative sources of aggregate (secondary and recycled aggregates) as part of the Proposed Scheme construction. Where aggregates data are not available, assumptions will be made based on guidelines for aggregates provision on England (for the period 2005 – 2020) as set out in the National and Regional Guidelines for Aggregates Provision in England (Department for Communities and Local Government, 2009).

14.7.7. The likely types and estimated quantities of waste to be generated by the Proposed Scheme will be assessed. Impacts will be evaluated against the capacity of regional (or if appropriate, national) landfill infrastructure.

PROPOSED SIGNIFICANCE CRITERIA

Magnitude

14.7.8. Table 14.8 sets out the criteria for assessing the magnitude of impact from materials and waste. For the purposes of this assessment, Method W1 (void capacity), as set out in the IEMA guidance, will be used.

Table 14.8 – Materials and Waste Magnitude Criteria

Magnitude	**Materials Criteria** **The assessment of the Project is made by determining whether the consumption of…**	**Inert and non-hazardous waste criteria** **The percentage depletion of remaining landfill void capacity**	**Hazardous waste criteria** **The percentage depletion of remaining landfill void capacity**
No change	...no materials is required	Zero waste generation and disposal from the development.	Zero waste generation and disposal from development
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional* baseline availability.	Waste generated by the development will reduce regional* landfill void capacity baseline[$] by <1%.	Waste generated by the development will reduce national landfill void capacity baseline[$] by <0.1%
Minor	...one or more materials is between 1-5% by volume of the regional* baseline availability; and/or the development has the potential to adversely and substantially[#] impact access to one or more allocated mineral sites (in their entirety), placing their future use at risk.	Waste generated by the development will reduce regional* landfill void capacity baseline[$] by 1-5%.	Waste generated by the development will reduce national landfill void capacity baseline[$] by <0.1-0.5%
Moderate	...one or more materials is between 6-10% by volume of the regional* baseline availability; and/or one allocated mineral site is substantially[#] sterilised by the development rendering it inaccessible for future use.	Waste generated by the development will reduce regional* landfill void capacity baseline[$] by 6-10%.	Waste generated by the development will reduce national landfill void capacity baseline[$] by <0.5-1%

Magnitude	Materials Criteria The assessment of the Project is made by determining whether the consumption of…	Inert and non-hazardous waste criteria The percentage depletion of remaining landfill void capacity	Hazardous waste criteria The percentage depletion of remaining landfill void capacity
Major	...one or more materials is >10% by volume of the regional* baseline availability; and/or more than one allocated mineral site is substantially[#] sterilised by the development rendering it inaccessible for future use.	Waste generated by the development will reduce regional* landfill void capacity baseline[$] by >10%.	Waste generated by the development will reduce national landfill void capacity baseline[$] by >1%
Notes	* or where justified, national. [#] justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed. [$] forecast as the worst-case scenario, during a defined Construction Phase.		

Sensitivity

14.7.9. The criteria for assessing sensitivity of materials and waste is set out in Table 14.9. The sensitivity of materials will be determined by identifying where one or more of the criteria from the following thresholds are met. The sensitivity of waste is determined by considering the Baseline/Future Baseline of regional (or where justified, national) landfill void capacity across the Construction Phase.

Table 14.9 - Materials and Waste Sensitivity Criteria

Sensitivity	Materials criteria On balance, the key materials required for the construction of the Project…	Inert and non-hazardous waste criteria Landfill void capacity is expected to…	Hazardous waste criteria Landfill void capacity is expected to…
Negligible	…are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; **and/or** …are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*	...remain unchanged, or is expected to increase through a committed change in capacity.	...remain unchanged, or is expected to increase through a committed change in capacity.
Low	…are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; **and/or** …are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.	...reduce minimally: by <1% as a result of wastes forecast.	...reduce minimally: by <0.1% as a result of wastes forecast.

Sensitivity	Materials criteria On balance, the key materials required for the construction of the Project…	Inert and non-hazardous waste criteria Landfill void capacity is expected to…	Hazardous waste criteria Landfill void capacity is expected to…
Medium	…are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; **and/or** …are available comprising some sustainable features and benefits compared to industry-standard materials.	...reduce noticeably: by 1-5% as a result of wastes forecast.	...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.
High	…are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; **and/or** …comprise little or no sustainable features and benefits compared to industry-standard materials.	...reduce considerably: by 6-10% as a result of wastes forecast.	...reduce considerably: by 0.5-1% as a result of wastes forecast.

Sensitivity	Materials criteria On balance, the key materials required for the construction of the Project…	Inert and non-hazardous waste criteria Landfill void capacity is expected to…	Hazardous waste criteria Landfill void capacity is expected to…
Very High	…are known to be insufficient in terms of production, supply and/or stock; **and/or** …comprise no sustainable features and benefits compared to industry-standard materials.	... reduce very considerably (by>10%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.	... reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.
Notes	* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.		

Significance of effects

14.7.10. In accordance with the IEMA guidance, the Significance of effects from materials and waste will be determined by comparing sensitivity and Magnitude within the matrix provided in Table 14.10.

Table 14.10 – Matrix to Assign Significance of Effect Category

		Sensitivity of Receptor				
		Negligible	**Low**	**Medium**	**High**	**Very high**
Magnitude of Impact	**No change**	Neutral	Neutral	Neutral	Neutral	Neutral
	Negligible	Neutral	Neutral or slight	Neutral or slight	Slight	Slight
	Minor	Neutral or slight	Neutral or slight	Slight	Slight or moderate	Moderate or large
	Moderate	Neutral or slight	Slight	Moderate	Moderate or large	Large or very large
	Major	Slight	Slight or moderate	Moderate or large	Large or very large	Very large

14.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

14.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

Material Assets

- The assessment of material assets will be based upon the validity of the collated information, regarding the resources that are expected to be consumed during the 'in scope' lifecycle phases of the Proposed Scheme.
- The assessment Baseline uses the most recent available data, which is up to and including 2019 (unless stated otherwise).
- A lifecycle assessment (including embodied carbon and water) of materials will not be part of the environment assessment process, as the effort and resources required are deemed disproportionate to the benefit they would offer the assessment of Significance of effect.

Waste

- The assessment of impacts and effects on landfill void capacity will be based upon the validity of the collated information, regarding the waste generated and disposed of by the Proposed Scheme during in scope phases of the development.
- Baseline data and information for the assessment are (unless otherwise stated) available up to and including 2018.
- Landfill operators can claim commercial confidentiality for their data at time of submission; data for sites with a commercial confidentiality agreement in place are therefore unavailable for the analyses presented in this chapter.

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15. GREENHOUSE GASES

15.1. INTRODUCTION

15.1.1. The requirement to consider a project's impact on and vulnerability to Climate Change results from the 2014 amendment to the Environmental Impact Assessment (EIA) Directive (2014/52) (The European Parliament and the Council of the European Union, 2014). The Directive has been fully transposed into UK law in the EIA Regulations. The Directive requires: "*A description of the likely significant effects of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change*."

15.1.2. As such this chapter considers the impacts and effects of the Proposed Scheme in terms of the contribution to Climate Change: The Greenhouse Gas (GHG) Emissions assessment.

15.1.3. This chapter presents the methods and scope of the assessment that will examine the Proposed Scheme's impact on Climate Change, to be presented in the Environmental Statement (ES). In addition, Baseline information, potential Mitigation Measures, and potential Residual Effects are reported.

15.2. BASELINE CONDITIONS

15.2.1. In the 'do nothing' current Baseline scenario, without the Proposed Scheme, GHG Emissions occur constantly and widely as a result of human and natural activity. This includes Emissions related to energy consumption (fuel, power), industrial processes, land use and land use change. The GHG assessment will only consider instances in which the Proposed Scheme results in additional or avoided Emissions in comparison to the Baseline scenarios and its assumed evolution. The Baseline conditions therefore focus on those Emissions sources subject to change between the Baseline scenarios and the Proposed Scheme.

15.2.2. The latest summary of GHG Emissions for 2018 within Selby, North Yorkshire, and the UK are presented in Table 15.1 (BEIS, 2012). Emissions from Repower and split of Emissions for the different fuel types will be given for context in the Environmental Statement (ES) assessment. These Emissions have only been provided for context and are not the Baseline Emissions for this assessment.

Table 15.1 – Emissions sources (2018) for Selby, North Yorkshire and the UK

Emissions Sources	Selby ($ktCO_2$)	North Yorkshire ($ktCO_2$)	UK ($ktCO_2$)
A. Industry and Commercial Electricity	69.3	440.3	42,794
B. Industry and Commercial Gas	253.3	571.2	36,193
C. Large Industrial Installations	26.3	30.4	31,443
D. Industrial and Commercial Other Fuels	105.3	363.3	16,900
E. Agriculture	13.9	199.5	5,964
Industry and Commercial Total	**468.1**	**1,604.7**	**133,293**
F. Domestic Electricity	35.3	262.7	24,853
G. Domestic Gas	75.8	567.2	60,919
H. Domestic 'Other Fuels'	33.3	242.1	10,658
Domestic Total	**144.4**	**1,072.0**	**96,430**
I. Road Transport (A roads)	163.6	911.4	54,229
J. Road Transport (Motorways)	111.0	568.4	29,936
K. Road Transport (Minor roads)	40.9	477.7	38,486
L. Diesel Railways	14.1	51.3	1,900
M. Transport Other	9.9	35.0	2,249
Transport Total	339.5	2,043.9	126,801
N. Land Use, Land Use Change and Forestry Net Emissions	-22.1	-210.3	-11,700

Emissions Sources	Selby ($ktCO_2$)	North Yorkshire ($ktCO_2$)	UK ($ktCO_2$)
Grand Total	**930.0**	**4,510.2**	**344,824**

Table 15.2 – Total and per capita Emissions (2018) for Selby, North Yorkshire and the UK

	Selby	North Yorkshire	UK
Grand Total ($ktCO_2$)	**930.0**	**4,510.2**	**344,824**
Population ('000s, mid-year estimate)	89	615	66,436
Per Capita Emissions (t)	10.44	7.34	5.19

15.2.3. Drax Power Station currently operates on four biomass units and two coal units. However, the Emissions in the current Baseline scenario will consider the biomass units only, as the coal units will be decommissioned in 2021. Emissions in the current baseline scenario will include biomass combustion, the supply chain (e.g. for production and transport) as well as GHG sequestration (growth of biomass for fuels).

15.2.4. At present, data is not available on these Emissions, but will be reported in the next stage of the climate assessment in the ES. The purpose of the operation of the Proposed Scheme is to capture these Emissions released in the current Baseline scenario. Data on these Emissions will therefore be used to calculate the avoided Emissions during the operation of the Proposed Scheme.

FUTURE BASELINE

15.2.5. The future construction Baseline is zero Emissions as this scenario involves no construction activities. In the Future Baseline scenario, Drax Power Station will operate on four biomass units. The operational GHG Emissions in the ‘do nothing’ Future Baseline scenario, therefore, include those from biomass fuels for electricity generation, as well as their supply chain (as above).

15.3. STUDY AREA

15.3.1. The GHG assessment is not restricted by geographical area but instead includes any increase or decrease in Emissions as a result of the Proposed Scheme, wherever that may be. This includes:

- Construction Emissions within the Site Boundary but also related to the transport of materials to and from the Proposed Scheme and their manufacture (this may be distant from the Proposed Scheme location); and
- Operational Emissions (increase or reduction in Emissions) which result from the operation of the electricity generation infrastructure and its supply chain.

15.4. SENSITIVE RECEPTORS / RESOURCES

15.4.1. The impacts of GHG Emissions relate to their contribution to global warming and Climate Change. These impacts are global and cumulative in nature, with every tonne of GHGs contributing to impacts on natural and human systems. GHG Emissions result in the same global effects wherever and whenever they occur and, therefore, the sensitivity of different human and natural Receptors is not considered.

15.5. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

CONSTRUCTION PHASE

15.5.1. The magnitude of GHG Emissions associated with the Construction Phase of the Proposed Scheme can be reduced by the following preliminary Mitigation and Enhancement Measures:

- Detailed design optimisation to reflect the carbon reduction hierarchy (BSI, 2016);
- Minimising the quantities of materials required to construct the Proposed Scheme;
- Maximising the use of construction materials and products with recycled or secondary and low carbon content;
- Using locally-sourced materials where available and practicable to minimise the distance materials are transported from source to Site;
- Using more efficient construction plant and delivery modes/vehicles, and/or those powered by electricity from alternative/lower carbon fuels; and.
- Using innovative construction methods to reduce plant use.

15.5.2. Mitigation Measures will be developed further in the ES.

OPERATIONAL PHASE

15.5.3. The magnitude of GHG Emissions associated with the Operational Phase of the Proposed Scheme can be minimised by, amongst other things:

- Designing, specifying and constructing the Proposed Scheme with a view to:
  - Maximising the operational effectiveness (% Carbon Capture) and minimising the parasitic load;

  - Maximising the operational lifespan and minimising the need for maintenance and refurbishment (and all associated Emissions); and
  - Maximising the potential for reuse and recycling of materials/elements at the end-of-life stage.
- Specifying high efficiency mechanical and electrical equipment such as lighting and telecoms; and
- Operating, maintaining and refurbishing the Proposed Scheme using best-practice efficient approaches and equipment.

15.6. DESCRIPTION OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION PHASE

15.6.1. Table 15.3 identifies the Likely Significant Effects which may be associated with the Construction Phase:

Table 15.3 – Key Emissions Sources During the Construction Phase

Lifecycle Stage (with codes as per PAS 2080 (BSI, 2016))		Potential Sources of Emissions (Not Exhaustive)
Construction	Product stage (manufacture and transport of raw materials to suppliers) A1-3	Embodied Emissions associated with extraction and manufacturing of the required construction materials.
	Transport of materials to Site A4	Emissions from fuel and electricity used in vehicles transporting materials to site.
	Plant and equipment use during construction A5	Emissions from fuel and electricity used in plant and equipment on site.
	Transport of waste A5	Emissions from fuel/energy used in vehicles transporting materials to away from site.
	Disposal of waste A5	Emissions from the final disposal of waste materials.
	Land use, land use change and forestry A5	Change in Emissions associated with the land use change due to the Proposed Scheme.

OPERATIONAL PHASE

15.6.2. Table 15.4 identifies the Likely Significant Effects which may be associated with the Operational Phase:

Table 15.4 – Key Emissions Sources During the Operation and End of Life Phase

Lifecycle Stage (as per PAS 2080 (BSI, 2016))		Potential Sources of Emissions (Not Exhaustive)
Operation	Operation B1	Electricity used for lighting.
	Operation B1	Embodied Emissions associated with extraction and manufacturing of the required solvent for operation.
	Maintenance, repair, replacement, refurbishment B2-5	Embodied Emissions, and Emissions from transport and plant associated with maintenance, repair, replacement, and refurbishment.
	Operational energy use B6	Emissions from the combustion of fuel on site for electricity generation required for the parasitic load as well as for the production and supply of those fuels.
	Land use, land use change and forestry B8	Change in Emissions associated with the land use change due to the existence of the Proposed Scheme hindering or promoting the sequestration of carbon dioxide.

15.6.3. The Magnitude of Emissions associated with the Proposed Scheme will not be quantified until the ES is produced, and as such the impact of the Proposed Scheme on the climate is not currently known. However, it is assumed that the Proposed Scheme will have a significant beneficial Impact as the purpose of operating the Proposed Scheme is to be carbon negative (capturing considerably more GHG Emissions than are emitted through the powering of the Proposed Scheme).

IMPACTS SCOPED IN OR OUT OF FURTHER ASSESSMENT

15.6.4. Based on the Emissions sources identified above and using guidance from the Institute of Environmental Management and Assessment (IEMA) (IEMA, 2017), professional judgement has been used to determine the material sources of GHG Emissions to scope in for further consideration in the ES. The elements scoped in or out for the GHG assessment are as follows:

Table 15.5 – Greenhouse Gas – Impacts Scoped in or Out of Further Assessment

Impacts	Phase	Scoped In	Scoped Out	Justification
Product stage (manufacture and transport of raw materials to suppliers) **A1-3**	Construction	Y		Raw materials required for the Proposed Scheme will result in embodied Emissions and have the potential to be large.
Transport of materials to Site **A4**	Construction	Y		Construction Phase Emissions from fuel / energy consumption due to the delivery of material to Site have the potential to be large.
Plant and equipment use during construction **A5**	Construction	Y		Fuel / energy consumption of plant and equipment used during construction would generate GHG Emissions.
Solvent used for the Carbon Capture process B1	Operation	Y		Solvent materials required for the operation of the Proposed Scheme will result in embodied Emissions and have the potential to be large.
Replacement and refurbishment **B2-5**	Operation	Y		The replacement and refurbishment of the Proposed Scheme would release a potentially large Magnitude of Emissions. These Emissions would be from embodied Emissions from the product stage, transport of material and plant use during replacement.
Operational energy use B6	Operation	Y		The capture of Emissions from the combustion of biomass fuel on Site for electricity generation has the potential to be large.

Impacts	Phase	Scoped In	Scoped Out	Justification
Disposal of waste **A5**	Construction		Y	Emissions from the disposal of waste are unlikely to be large, due to a large proportion of construction waste being inert.
Land use, land use change and forestry **A5**	Construction		Y	Emissions from the land use change during construction are not expected to be large.
Electricity used for lighting **B1**	Operation		Y	Lighting associated with the Proposed Scheme is not anticipated to be an Emission source as there will be no change to lighting.
Maintenance **B2-5**	Operation		Y	Maintenance associated with the Proposed Scheme is not considered to be a large Emissions source as only a small amount will be additional to the maintenance that already takes place.
Repair **B2-5**	Operation		Y	The Proposed Scheme is designed to be maintained rather than repaired, therefore subsequent repair Emissions sources are not considered to be large.
Land use, land use change and forestry B8	Operation		Y	The reduction in carbon sequestration due to the land use change from the Proposed Scheme is not considered to be large.

15.7. PROPOSED ASSESSMENT METHODOLOGY

15.7.1. The assessment approach considers the likely magnitude of GHG Emissions (or avoided Emissions) in comparison to the Baseline scenario without the Proposed Scheme. It considers Emissions throughout the lifecycle of the Proposed Scheme including:

- Construction Phase; e.g. embodied Emissions associated with materials, transportation of materials to Site and waste/arisings from Site, and the construction process; and
- Operational Phase; e.g. operation of lighting and controls, maintenance and replacement of original materials, as well as Emissions and avoided Emissions from the Carbon Capture process.

15.7.2. For all lifecycle stages and sub-stages of the Proposed Scheme, the assessment will include the following:

- Collection of available data/information on the scale of GHG emitting activities (e.g. tonnes of concrete, litres of fuel, kWh of electricity) and GHG capturing activities for the Baseline scenario and for the Proposed Scheme. In each case this will cover the Proposed Scheme lifecycle (minimum design life of 25 years); and
- Calculation of the GHG Emissions by applying a suitable emissions factor (tCO_2e per unit of Emissions generating activity).

EMISSIONS CALCULATIONS

15.7.3. Emissions calculations will focus on Emissions annually and throughout the Proposed Scheme lifecycle. Values will be reported as tonnes of carbon dioxide equivalents (tCO_2e).

SIGNIFICANCE CRITERIA

15.7.4. Any magnitude of emitted or avoided GHG Emissions makes a cumulative contribution to Climate Change (positive or negative) and therefore there are no clear thresholds for what level of GHG Emissions can be considered significant in an EIA context.

15.7.5. Significance of GHG impacts is assessed with the best practice technique of comparing estimated GHG Emissions arising from the Proposed Scheme with the respective UK carbon budget (Table 15.6), which have been set by the UK Government covering 2018 to 2037. As such the magnitude of emissions, in conjunction with guidance from IEMA (IEMA, 2017) will inform professional judgement of significance.

15.7.6. The Sixth Carbon Budget was released by the Committee on Climate Change (CCC) in December 2020, which sets the limit on allowed UK territorial GHG Emissions over the period 2033 to 2037. The CCC advise the ‘Balanced Net

Zero Pathway', reducing Emissions by 2035 to 78% below 1990 levels. However, it is yet to be legislated (it must be by the middle of 2021).

Table 15.6 – National Carbon Budgets set by the Government

Carbon Budget Period	UK Carbon Budget
Third: 2018-2022	2,544 $MtCO_2e$
Fourth: 2023-2027	1,950 $MtCO_2e$
Fifth: 2028-2032	1,725 $MtCO_2e$
Sixth: 2033-2037	965 $MtCO_2e$

15.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

15.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- It is assumed the following data will be provided by Drax for the assessment undertaken for the GHG in the ES:
  - Emissions occurring at Drax Power Station from the combustion of biomass for electricity generation.
  - The Emissions intensity for the power which would be used for the parasitic load.
  - The amount of carbon Emissions captured by the Proposed Scheme.
- The assessment of GHG Emissions relating to the generation of electricity from biomass combustion at Drax Power Station will not be considered in this assessment; including the whole life cycle GHG balance for biomass fuel production and transport. It is assumed that these Emissions remain consistent in the Baseline, Future Baseline and Proposed Scheme scenarios.
- The assessment will assume that there will be no change in the operating hours in the Baseline scenarios and the Proposed Scheme.
- The assessment is expected to take place before the detailed design is finalised and a contractor is on site, and as such there will be some uncertainty regarding the types and quantities of materials to be used in construction. Where data is unavailable, worst-case reasonable assumptions will be used; and
- The assessment of significance will be based, in part, on professional judgement.

15.9. REFERENCES

- BEIS. (2012). UK Local and Regional CO2 emissions. Department for Business, Energy and Industrial Strategy. Retrieved from https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018
- BSI. (2016). PAS 2080: Carbon Management in Infrastructure.
- IEMA. (2017). Assessing Greenhouse Gas Emissions and Evaluating their Significance. Retrieved from https://www.iema.net/assets/newbuild/documents/IEMA%20GHG%20in%20EIA%20Guidance%20Document%20V4.pdf
- The European Parliament and the Council of the European Union. (2014). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052

16. MAJOR ACCIDENTS AND DISASTERS

16.1. INTRODUCTION

16.1.1. This purpose of this Major Accidents and Disasters (MA&D) chapter is to:

- Identify the MA&D topics and types that are proposed to be the subject of the environmental assessment – those topics that are "scoped in";
- Eliminate those MA&D topics and types not requiring further consideration, and which would therefore not be taken further in the environmental assessment – those topics that are "scoped out"; and
- Define the approach to, and methodologies for, identifying potential MA&D events and their assessment.

16.1.2. The definitions of key terms used in this section are given in Table 16.1. These definitions have been developed by reference to the definitions used in EU and UK legislation and guidance relevant to Major Accidents and / or Disasters (as set out below) as well as professional judgement in the context of the Proposed Scheme:

- Civil Contingencies Act 2004 (c. 36);
- Emergency Response and Recovery – Non-statutory guidance accompanying the Civil Contingencies Act 2004, Cabinet Office, 28 October 2013 (HM Government, 2013)
- The Seveso III Directive (Directive 2012/18/EU);
- Control of Major Accident Hazards (COMAH) Regulations 2015 (SI 2015 No. 483);
- The COMAH Regulations 2015: Guidance on Regulations, L111, Third Edition (Health and Safety Executive, 2015).
- All Measures Necessary - Environmental Aspects (COMAH Competent Authority, 2016);
- Chemical and Downstream Oil Industries Forum Guideline - Environmental Risk Tolerability for COMAH Establishments. (SEPA, 2018).
- Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009;
- Guidance: Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009. Mining Waste Directive: Article 6 Category "A" Waste Facilities. (Defra, 2011);
- What is a Disaster? (International Federation of Red Cross and Red Crescent Societies, 2020); and
- Oxford English Dictionary.

Table 16.1 – Key Terms and Definitions Relevant to this Rection of the EIA Scoping Report

Term	Definition
Major Accident	In the context of the Proposed Scheme, an event that threatens immediate or delayed serious damage to human health, welfare and / or the environment and requires the use of resources beyond those of the Applicant or its contractors to respond to the event. Serious damage includes the loss of life or permanent injury, and / or permanent or long-lasting damage to an environmental Receptor that cannot be restored through minor clean-up and restoration efforts. The Significance of this effect will take into account the extent, severity and duration of harm and the sensitivity of the Receptor.
Consultation Zone	The Health & Safety Executive (HSE) sets a Consultation Distance (CD) around major hazard sites and Major Accident hazard pipelines after assessing the risks and likely effects of Major Accidents at the major hazard. The area enclosed within the CD is referred to as the consultation zone. The Planning Authority is notified of this CD and has a statutory duty to consult HSE on certain proposed developments within the zone the CD forms.
Disaster	In the context of the Proposed Scheme, a naturally occurring phenomenon such as an extreme weather event (for example storm, flood, temperature) or ground-related hazard events (for example subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a Major Accident as defined above.
External Influencing Factor	A factor which occurs beyond the Site Boundary that may present a risk to the Proposed Scheme, e.g. if an external major event occurred (e.g. earthquake, COMAH site Major Accident) it would increase the risk of serious damage to an environmental Receptor associated with the Proposed Scheme.
Hazard	Anything with the potential to cause harm, including ill-health and injury, damage to property or the environment; or a combination of these.
Internal Influencing Factor	A factor which occurs within the Site Boundary that may present a risk to the Proposed Scheme.

Term	Definition
Major Event Group	A major event which can be grouped as either a Natural Hazard (Disaster), or Technological or Manmade Hazard (Major Accident) (see para 16.3.2).
Major Event Category	A set of values used to categorise events within a related parent Major Event Group. (see para 16.3.2).
Major Event Type	A set of values used to sub-categorise events within a major event category.
Risk	The likelihood of an Impact occurring combined with effect or consequence(s) of the Impact on a Receptor if it does occur.
Risk Event	An identified, unplanned event, which is considered relevant to the Proposed Scheme and has the potential to be a Major Accident and / or Disaster subject to assessment of its potential to result in a significant adverse effect on an environmental Receptor.
Vulnerability	In the context of the 2014 EU Directive, on the assessment of the effects of certain public and private projects on the environment, the term refers to the 'exposure and resilience' of the Proposed Scheme to the risk of a Major Accident and / or Disaster. Vulnerability is influenced by sensitivity, adaptive capacity and Magnitude of Impact.

16.2. BASELINE CONDITIONS

16.2.1. The baseline relevant to this topic comprises:

- Features external to the Proposed Scheme that contribute a potential source of hazard to it;
- Sensitive environmental Receptors at risk of significant effect; and
- Current (without the Proposed Scheme) MA&D risks for the existing locality.

16.2.2. The baseline conditions described for MA&D events are derived from the following desk study sources:

- National Risk Register of Civil Emergencies (Cabinet Office, 2017);
- British Geological Survey (BGS) GeoIndex Onshore (BGS, 2020);
- Tsunamis Hazard Map (Prevention Web Europe, 2005);
- The International Disaster Database (EM-DAT, 2020);
- Health and Safety Executive's (HSE) Planning Advice Web App (HSE, 2020);

- HSE's COMAH 2015 Public Information Search (HSE, 2020);
- Ordnance Survey mapping;
- Google aerial and street view maps covering the study area (Google, 2020); and
- Technical Scoping Report chapters (Chapters 4 to 16).

16.3. STUDY AREA

16.3.1. The extent of the Study Area will be a 2.5 km radius around the Site Boundary. The Study Area for MA&D has been developed based on professional judgement as there is no specific regulatory guidance nor significant precedent / standardised methodology. A radius of 2.5 km was used in order to capture internal and external influencing factors which may have high adverse consequences on the Proposed Scheme (e.g. COMAH site, Major Accident hazard pipeline, earthquake).

16.3.2. Within the Study Area, Accident and Disaster groups (i.e. Natural Hazards, and Technological or Manmade Hazards) and categories were considered, along with potential external influencing factors, such as:

- Natural Hazard group categories, e.g.
  - Geophysical;
  - Hydrology;
  - Climatological and metrological; and
  - Biological.
- Technological or Manmade Hazard group categories, e.g.
  - Societal;
  - Industrial and Urban accidents;
  - Transport accidents;
  - Utility failures;
  - Malicious attacks; and
  - Engineering failures and accidents.

16.3.3. Schedule 4 of The Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (the EIA Regulations) sets out the information that should be included in an ES where that information is relevant to the specific characteristics of the particular development. As such, the Scoping Report has considered the following Receptors:

- Members of the public and local communities;
- Infrastructure and the built environment;
- The natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape;

- The historic environment, including archaeology and built heritage; and
- The interaction between the factors above.

16.3.4. The study has been based primarily on information held by the Applicant and information developed as part of the EIA Scoping Report by the WSP project team.

16.4. KEY MAJOR EVENT RECEPTORS

16.4.1. This section identifies a set of selected key major event Receptors. Specifically, those Receptors that may be directly affected by the occurrence of a major event.

16.4.2. The following key major event Receptors identified in the baseline within the Study Area are listed in Table 16.2 below.

Table 16.2 – Identified Key Receptors for Major Events

Major Event Receptor	Type	Description
Drax COMAH installation	Major Accident hazard	Lower tier COMAH installation
Ouse	River	Being used for the transportation of construction materials

16.5. MITIGATION MEASURES

16.5.1. The Applicant has committed to constructing and managing the Proposed Scheme in accordance with the following non-exclusive list of standards and systems:

- Environmental, Health & Safety Management systems;
- Supplier management environmental, health & safety standards (e.g. Construction Skills Certification Scheme (CSCS));
- Risk management systems; and
- Construction and Environmental Management systems (including the Construction Environmental Management Plan (CEMP)).

16.6. DESCRIPTION OF POTENTIAL VULNERABILITY TO MAJOR ACCIDENT AND DISASTER RISKS

16.6.1. The applicable legislative framework covering the design, construction, operation of the Proposed Scheme is summarised as follows:

- Health and Safety at Work etc. Act 1974 (c. 37);

- •Construction (Design and Management) (CDM) Regulations 2015 (SI 2015 No. 15); and
- •Pipeline Safety Regulations 1996 (SI 1996 No. 825).

16.6.2. There is no published guidance for the application of the legal requirements to the assessment of MA&D. However, selected relevant guidance for risk assessment methodologies is summarised as follows:

- Guidelines for Environmental Risk Assessment and Management. (Defra and Cranfield University, 2011);
- Chemical and Downstream Oil Industries Forum Guideline - Environmental Risk Tolerability for COMAH Establishments (SEPA, 2018); and
- ISO 31000: 2009 Risk Management – principles and guidelines (The International Standards Organisation).

16.6.3. Additionally, the following have been consulted to support the identification of potential MA&D:

- The Cabinet Office National Risk Register of Civil Emergencies (2017 Edition) (Cabinet Office, 2017). This document is the unclassified version of the National Risk Register and it identifies the main types of civil emergencies that could affect the UK in the next five years. It is recognised, however, that this document does not provide an all-encompassing list of all potential Accidents and Disasters and its timescales are short term.
- The International Federation of Red Cross & Red Crescent Societies Early Warning, Early Action (2008) (International Federation of Red Cross and Red Crescent Societies, 2020). This guidance looks to other countries including those in warmer climates, thereby identifying risks that the UK may encounter in the future in light of climate change and global warming.
- The International Disaster Database (EM-DAT, 2020) contains data covering over 22,000 mass Disasters in the world since 1900 to the present day and aims to "*rationalise decision making for disaster preparedness, as well as provide an objective base for vulnerability assessment and priority setting*".

Scoping Process

16.6.4. A three-tiered process has been used at this stage to scope MA&D groups / categories / types in / out for detailed assessment in the ES:

- Firstly, low likelihood and low consequence events are scoped out as these events are unlikely to result in significant adverse effects as they do not fall into the definition of a MA&D. Highly likely and low consequence events are also scoped out as they will not lead to significant adverse effects. Furthermore, high likelihood and high consequence events are also scoped out, as it is assumed that existing legislation (see Appendix A) and regulatory controls would not permit the Proposed Scheme to be progressed under these circumstances.

- The second component is in accordance with emerging EIA practice, whereby occupational health and safety (H&S) is scoped out of this topic (other health issues are covered in relevant topic sections of air quality and noise and vibration, and flood risk and the water environment. As such, human health Impacts are “in combination” Impacts and are considered under the Cumulative Effects heading) as it is covered by detailed H&S legislation: (The Management of Health and Safety at Work Regulations 1999, The Workplace (Health, Safety and Welfare) Regulations 1992 and The Dangerous Substances and Explosive Atmospheres Regulations 2002.
- The third component is the formation of the Initial Long List of all possible MA&D major event groups, categories and types. This is reviewed to rule out any potential Accidents and Disasters that are considered highly unlikely to occur due to the location of the Proposed Scheme, based on information provided by the environmental topic teams and use of information sources related to Accidents and Disasters (BGS, 2020) (Prevention Web Europe, 2005).

16.6.5. Those MA&D major event types that cannot be screened out from the three tier process will form the in scope MA&D major event types which will require further detailed assessment in the ES.

16.6.6. This review of the Accident and Disaster event groups, categories and types identified in the Study Area, to inform the Scoping process, is reported in Appendix A and summarised in Table 16.3. This table shows the potential vulnerability of the Proposed Scheme to the risk of a Major Accident and / or Disaster event at the type level. The phases are indicated in the table as “C” for Construction Phase and “O” for Operational Phase. The ES will provide greater assessment and justification for the topic areas scoped in and for those that are scoped out no further assessment is considered necessary in the EIA.

Table 16.3 – Major Accidents and Disasters – Scoped In or Out of Further Assessment

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Geophysical	Earthquakes	Do not occur in Britain of a sufficient intensity owing to the motion of the Earth's tectonic plates causing regional compression. Uplift from the melting of the ice sheets that covered many parts of Britain thousands of years ago can also cause movement. The BGS acknowledges that on average, a magnitude 4 earthquake happens in Britain roughly every two years and a magnitude 5 earthquake occurs around every 10 to 20 years. As such, the Cabinet Office National Risk Register of Civil Emergencies states that "Earthquakes in the UK are moderately frequent but rarely result in large amounts of damage. An earthquake of sufficient intensity (determined on the basis of the earthquake's local effect on people and the environment) to inflict severe damage is unlikely". Proposed Scheme not in or close to an active area.	N
Natural Hazards	Geophysical	Volcanic Activity	Proposed Scheme is not in an active area and highly unlikely that an ash cloud could significantly impact on any aspect of the Proposed Scheme.	N
Natural Hazards	Geophysical	Landslides	Historical landslides have not been recorded within the Site Boundary and the Proposed Scheme does not involve the formation of deep cuts / high embankments.	N
Natural Hazards	Geophysical	Sinkholes	This is likely to be covered in the geotechnical design, and there are no examples of areas that have been affected by sinkholes in the locality to warrant taking this event forward.	N
Natural Hazards	Geophysical	Tsunamis	The Proposed Scheme is located inland, outside a tsunamis risk zone.	N
Natural Hazards	Hydrology	Coastal Flooding	The Proposed Scheme is located inland, outside a coastal area.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Hydrology	Fluvial Flooding	Environment Agency Flood Map for Planning (Rivers and Sea) (Environment Agency, 2020) indicates that the northern and southern part of the Drax Power Station site, Carr Lane, Redhouse land and the area of the Existing Drax Jetty are located in the high risk Flood Zone 3 but benefit from the existing flood defences on the River Ouse. Flood Zone 3 is described as land assessed as having a 1 in 100 or greater annual probability of flooding from river or a 1 in 200 or greater annual probability of flooding from see in any year. The risk of flooding in this area is associated with the River Ouse, which is tidally influenced at this location, with minor fluvial contributions. There is a risk of breach of flood defences.	Y C, O
Natural Hazards	Hydrology	Pluvial Flooding	A review of the Environment Agency's Flood Risk from Surface Water Map (Environment Agency, 2020) shows isolated areas within the area of the Proposed Scheme to be at low to high risk of flooding from surface water. Surface water flooding is likely to be associated with localised depressions where water will pond during or after prolonged rainfall events.	Y C, O
Natural Hazards	Hydrology	Groundwater Flooding	As part of Drax Repower Project, the Selby Internal Drainage Board advised that high groundwater levels occur in the area of the Proposed Scheme. Risk of flooding from groundwater will be assessed as part of the Flood Risk Assessment which will be supporting the EIA.	Y C, O
Natural Hazards	Hydrology	Avalanches	Not considered relevant given the geographical location of the Proposed Scheme. The Proposed Scheme's topography is relatively flat and therefore an avalanche will not occur.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Climatological and Metrological	Cyclones, hurricanes, typhoons, storms and gales	Cyclones, hurricanes and typhoons do not occur in the UK. The winter of 2015 / 2016 was the second wettest winter on record and a series of storms (including 'Desmond' and 'Eva') resulted in heavy and sustained rainfall. 17,600 UK properties were flooded and several bridges collapsed, disrupting access to and from local communities. According to the latest five year meteorological data (2002 - 2016) from RAF Waddington, the greatest wind speed recorded was 66 km/h. The RAF Waddington site is located more than 60 km south of Drax and therefore a review of wind speeds during 2009-2012 from the closest weather station to Drax at Church Fenton, decommissioned in 2013, identified a maximum wind speed of 76 km/h. Storms and gales could result in damage to new site infrastructure, property and works on site. However, it is anticipated that the risk of vulnerability to MA&D event for the Proposed Scheme would be comparable to that for the Drax Power Station and design standards would take into account these weather conditions.	N
Natural Hazards	Climatological and Metrological	Thunderstorms	This type of event could result in lightning strikes to temporary elevated structures during construction (e.g. tower cranes) and new elevated structures (such as columns, chimney stacks and cooling towers) introduced as part of the Proposed Scheme; however, the risk is no different to similar elevated structures on site. New elevated structures will be designed taking into historical site experience and current design standards taking into account climate change resilience. Specific measures are therefore not considered to be required as part of the Proposed Scheme and additional assessment in the ES are not required.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Climatological and Metrological	Wave surges	The Proposed Scheme is located sufficiently inland, and therefore is not subject to wave surges.	N
Natural Hazards	Climatological and Metrological	Extreme temperatures: Heatwaves Low (sub-zero) temperatures and heavy snow	This type of event could give rise to changes in climatic conditions, with site infrastructure exposed to greater heat intensity and exposure to sunlight. Heavy snow could cause workers and delivery vehicles and drivers to be trapped. In August 1990, the UK experienced heatwave conditions with temperatures reaching what was then a record 37.1°C in Cheltenham, England. In August 2003 a UK heatwave lasted 10 days and resulted in over 2,000 deaths. High temperature records are now being broken with increasing frequency. The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010. Daytime temperatures were mostly sub-zero across the UK. At night, temperatures in England regularly fell to -5°C to -10°C. Snowfall across the UK lasted for some time, allowing 20cm to 30cm of snow to build up, closing schools and making it very difficult to travel. Between 1981 and 2010, there were 12 occurrences where summer mean temperatures exceeded 25.2°C on five or more consecutive days. Between 1981 and 2010, there have been 1,368 days with a maximum minimum temperature below zero degrees Celsius. Between 1981 and 2010, there were 229 days with snow lying at 0900 however, there are no records from the Met Office of the depth of snow. However, the risk is no different to those for the existing Drax Power Station.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Climatological and Metrological	Droughts	Over the past 40 years or so England has experienced five long-duration droughts and two shorter periods of drought. During the 2010-12 drought, parts of eastern England recorded their lowest 18-month rainfall total in over 100 years. Between April 2010 and March 2012, the Drax area only received 65-85% of rainfall compared with the 1981-2010 average. There was a drought in 1995-1996 which affected the area of the Proposed Scheme However, the Proposed Scheme should not be vulnerable to drought as water is not an essential service during the construction, use or maintenance phases. The design of the sub-structure will be resilient to ground shrinkage and should remain in the design risk register until designed out.	N
Natural Hazards	Climatological and Metrological	Severe Space Weather: Solar Flares	Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. There will be the use of technology to control processes and plant, however this is protected, therefore the Proposed Scheme is no more vulnerable than the existing systems on site. Further assessment in the ES is not required.	N
Natural Hazards	Climatological and Metrological	Severe Space Weather: Solar Energetic Particles	Solar energetic particles which cause solar radiation storms, but only in outer space, so this major event type can be scoped out.	N
Natural Hazards	Climatological and Metrological	Severe Space Weather: Coronal Mass Ejections	Coronal mass ejections (CME) cause geomagnetic storms. The geomagnetic storm in 2003 caused the UK aviation sector to lose some GPS functions for a day, however there were no known significant Impacts on road users or infrastructure.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Climatological and Metrological	Fog	Fog is one of the most common weather conditions in the UK, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50m over a wide area. The majority of the work on the Proposed Scheme is within the Drax Power Station site where vehicle speed is controlled to below 10 mph.	N
Natural Hazards	Climatological and Metrological	Wildfires: Forest fire, Bush / brush, pasture	In April and May 2011 numerous wildfires broke out across the UK after unusually hot and dry weather. England received only 21% of its usual rainfall for April 2011. The Proposed Scheme and surrounding area does not contain vegetation with a potential high fuel load such as gorse.	N
Natural Hazards	Climatological and Metrological	Poor Air Quality	In 2006 the UK experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. In the spring of 2015, two particle pollution episodes caused widespread poor air quality throughout the UK, with multiple areas measuring 'High' on the Daily Air Quality Index and resulted in around 1,100 deaths due to exacerbation of pre-existing ill-health conditions. Summer 2015 also contained two elevated ozone episodes. Construction: Construction effects would be temporary for the duration of the Construction Phase. Increased dust Emissions from construction activities and traffic could lead to potential loss of amenity at sensitive Receptors. Traffic management measures may result in both positive and adverse changes to Emissions from vehicle exhausts and roadside pollution concentrations. Operation: The Proposed Scheme is expected to result in changes to Emissions of amines and ammonia which require a variation to the site's existing environmental permit. In the	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			determination of the proposed variation to the permit, the Environment Agency will set Emission limits on amines and ammonia to air together with requirement to implement appropriate Mitigation Measures to prevent harm to environmental Receptors. Therefore, significant Residual air quality Effects which could result in a MA&D event are not anticipated during construction and operation of the Proposed Scheme.	
Natural Hazards	Biological	Disease epidemics: - Viral - Bacterial - Parasitic - Fungal - Prion	The Proposed Scheme is located in a developed country where the population is in general good health. Furthermore, the use of the Proposed Scheme is not going to give rise to any disease epidemics. Public Health England, the executive agency of the Department of Health is responsible for protecting the nation from public health hazards, preparing for and responding to public health emergencies. One of Public Health England's functions is to protect the public from infectious disease outbreaks and the Agency has produced a document providing operational guidance for the management of outbreaks of communicable disease, 'Communicable Disease Outbreak management: Operational Guidance'.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Natural Hazards	Biological	Animal Diseases: - zoonotic: • avian influenza • West Nile virus • Rabies - non-zoonotic: • foot and mouth • swine fever	Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last 10 years, most recently in the winter of 2016 / 17, although with no human cases reported. There was a devastating foot and mouth outbreak in 2001. Scoped out as the use of the Proposed Scheme is not going to be the source of any disease epidemics and spread would be controlled through containment of infected animals including prohibition of transportation.	N
Natural Hazards	Biological	Plants	Standard control measures would be implemented by the appointed contractor during construction to handle and dispose of any diseased plants and / or injurious weeds and prevent their spread.	N
Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead to violence and loss of life.	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts. Proposed Scheme is not considered highly controversial and should not lead to high profile public demonstrations.	N
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Significant security risks for humanitarian relief workers in some areas.	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Famine	The Proposed Scheme is located in a developed country that produces its own crops and imports food. It is politically stable and not subject to hyperinflation and therefore food is available, whether produced within the UK or imported. Famine is also not relevant to the use of the Proposed Scheme.	N
Technological or Manmade Hazards	Societal	Displaced population	There will be no significant displacement of populations as part of the Proposed Scheme.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical sites	There are no other COMAH sites within 5 km of the Drax Power Station other than the Drax Power Station itself, which is currently a lower tier establishment. The COMAH establishment is legally required to assess any additional risk introduced by development within its outer zone and implement measures to reduce those risks to it to be As Low As Reasonably Practicable (ALARP). Therefore it is proposed than no further evaluation in the ES is required on the COMAH establishment as an initiator of a MA&D event on the Proposed Scheme, however further evaluation of an event in the	Y C, O

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			Proposed Scheme triggering a domino effect on the COMAH establishment should be further evaluated in the ES.	
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines	A known proposed gas pipeline associated with the Knottingley Power Project has been identified within the Local Authority area however; the proposed route of the pipeline is a significant distance from the Proposed Scheme and will not impact the construction or operation of the Proposed Scheme. As part of the Drax Repower DCO (to be considered in the cumulative assessment), a natural gas pipeline has been approved to be run to the site. However, the proposed route is sufficiently distanced from the proposed Scheme. Once the pipeline is operational, if work was to be required within its consultation zone then it would be legally required to be demonstrated as ALARP under existing H&S legislation before being allowed to take place.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. Last historical Major Accident in the UK was Windscale in 1957. No nuclear sites within a 5km corridor along the Proposed Scheme.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England. The surrounding area was temporarily evacuated and some local businesses experienced long-term disruption to operations. There are no bulk fuel storage sites within the Study Area.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	Dam breaches in the UK are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding.	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			EA Flood Risk from Reservoirs map indicates that the northern and southern part of the Drax Power Station site, and the northern part of the proposed Laydown Area, is at risk of flooding from reservoirs.	
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	The Coal Authority interactive map (The Coal Authority, 2020) indicates that the area to the north of the Drax Power Station site is within a Coal Mining Reporting Area. However, online maps indicate that there are no known mines / openings in the area. The majority of the work will be on the Drax Power Station site close to existing structures and there is no historical evidence of subsidence.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	Construction: Fires could be initiated by construction related activities which impact areas adjacent to the construction activities such as the lower tier COMAH installation. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. Operation: There are no significantly sized urban buildings in close proximity of the Proposed Scheme structures. Notwithstanding this, the risk of fires affecting the Proposed Scheme from offsite urban developments during operation is no greater than risks for Drax Power Station.	Y C
Technological or Manmade Hazards	Transport accidents	Road	Significant transport accidents occur across the UK on a daily basis, mainly on roads, and involving private and / or commercial vehicles. During construction there will be an increase in heavy construction plant and equipment on local road network which may increase the risk of accidents.	Y C

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Technological or Manmade Hazards	Transport accidents	Rail	The only railway within the Site Boundary is that used for transporting coal and renewable fuel to the site from the Humber Port. The Proposed Scheme does not involve use or modification of the railway. Therefore, vulnerability of the Proposed Scheme to the risk of MA&D events related to rail transportation are not anticipated during construction and operation of the Proposed Scheme.	N
Technological or Manmade Hazards	Transport accidents	Waterways	It is proposed to us the River Ouse to transport construction materials by water from the Humber. It understood that discussions have been held between Wynns (transport contractor) and Humber Port Authorities to gain consent for the movements and in principle received. However, the detailed conditions and requirements will not be finalised until mid - 2021. Therefore, until further information is available it is proposed to scope in for further evaluation in the ES.	Y C
Technological or Manmade Hazards	Transport accidents	Aviation	There have been no major air accidents in the UK since the Kegworth incident in 1989. There are no working airfields within the Study Area.	N
Technological or Manmade Hazards	Pollution accidents	Air	Construction: Construction effects would be temporary for the duration of the Construction Phase. Increased dust Emissions from construction activities and traffic could lead to potential loss of amenity at sensitive Receptors. Traffic management measures may result in both positive and adverse changes to Emissions from vehicle exhausts and roadside pollution concentrations. Emissions from mobile plant and equipment covered under H&S and environmental legislation Operation: The Proposed Scheme is expected to result in changes to Emissions of amines and ammonia which require a variation to the site's existing environmental permit. In the	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			determination of the proposed variation to the permit, the EA will set Emission limits on amines and ammonia to air together with requirement to implement appropriate Mitigation Measures to prevent harm to environmental Receptors. Therefore, significant Residual air quality Effects which could result in a MA&D event are not anticipated during construction and operation of the Proposed Scheme, and it is therefore it proposed not to evaluate this further in the ES.	
Technological or Manmade Hazards	Pollution accidents	Land	During construction there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks. During operation, it is understood that a range of new hazardous wastes may be generated and stored on site before going offsite for treatment, however quantities and characteristics are not fully known at this time. Therefore, it is proposed to be scoped in for further evaluation in the ES when more information is known.	Y O
Technological or Manmade Hazards	Pollution accidents	Water	The majority of the Proposed Scheme is underlain by the Hemingbrough Glaciolacustrine Formation (Unproductive) with pockets of Breighton Sand Formation (Secondary A Aquifer) present in places. Furthermore, the areas adjacent to the River Ouse (north of the Proposed Scheme and the Existing Drax Jetty) are underlain by Alluvium (Secondary A Aquifer). The EA defines Secondary A Aquifers as 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. Unproductive strata are defined by the EA as having low permeability with negligible Significance for water supply or river base flow.	Y C, O

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			The Groundwater Vulnerability Map supplied by DEFRA (DEFRA, 2020) shows the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a single square kilometre. The groundwater vulnerability map indicates that Drax Power Station site has 'low' to 'medium' vulnerability whilst the areas which are underlain by Alluvium superficial deposits i.e. north of the Proposed Scheme and the Existing Drax Jetty area have 'medium – high' vulnerability. The Groundwater Source Protection Zone (SPZ) mapping (DEFRA, 2020) shows that the vast majority of the Drax Power Station site, southern part of the proposed Laydown Area, Carr Lane and western section of Redhouse Lane are located in Zone 3 of the Groundwater SPZ. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. SPZs are typically used to protect abstractions for public water supply. The northern part of the Drax Power Station site, including the area of the existing 'woodyard' laydown area, the northern section of the proposed Laydown Area and the area of the Existing Drax Jetty are not located in the Groundwater SPZ. During construction there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.	

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Technological or Manmade Hazards	Utilities failures	Electricity	Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. These tend of be mainly specific place, local (e.g. metropolitan area) and less frequently regional (e.g. North East) as a result of severe winter storms and consequent damage to the distribution overhead line network. Above-ground electrical transmission lines are present within the Site Boundary, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail. Information regarding diversion works will be considered in the EIA. The potential risk of construction-related incidents when undertaking diversion works and work close to key electrical infrastructure as part of the Proposed Scheme would be covered by existing legislation to manage and control risk events to be ALARP.	N
Technological or Manmade Hazards	Utilities failures	Gas	Underground and above-ground gas transmission pipelines are currently not present in the Site Boundary. Looking ahead, as part of the Drax Repower Project (to be considered in the cumulative assessment), a high pressure natural gas pipeline has been approved for connecting the site to the national grid. However, its proposed route is far enough from the work related to this Proposed Scheme that it is proposed that further evaluation in the ES is not required.	N
Technological or Manmade Hazards	Utilities failures	Water supply	There is a water supply connection at Drax Power Station. However, there are no connections in the construction area	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			which are believed to be significant enough to increase the vulnerability of the Proposed Scheme to a MA&D event.	
Technological or Manmade Hazards	Utilities failures	Sewage system	No use of the sewage system is associated with the Proposed Scheme. During the Construction Phase, temporary portable systems will be in place covered by H&S welfare requirements.	N
Technological or Manmade Hazards	Malicious Attacks	Unexploded Ordnance	A low potential exists for encountering unexploded ordnance during construction of the Proposed Scheme. Measures would be undertaken during construction to brief operatives to raise awareness of this issue, and to define appropriate response strategies should this be discovered during the works.	N
Technological or Manmade Hazards	Malicious Attacks	Attacks Chemical Biological Radiological Nuclear	Extremists remain interested in Chemical, Biological, Radiological and Nuclear (CBRN) materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Historical use has been in closed densely occupied structures (underground, buildings) or targeted at specific individuals. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Transport systems	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Crowded places	The Proposed Scheme does not fall within the definition of a crowed place, i.e. pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Cyber	Cyber attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. The increasing reliance on technology to control the	N

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
			carbon capture and storage processes and plant could render the Proposed Scheme more vulnerable to a cyber-attack. Notwithstanding this, it is not considered to be more vulnerable to attack than existing processes and plant on site and similar infrastructure installed and running on the UK power network. Drax is accountable to the Secretary of State (SoS) for Business, Energy and Industrial Strategy for ensuring the resilience of their strategic power generator stations and network to national security risks, including from terrorism, cyber-attack, natural hazards and other risks outlined in the National Risk Register of Civil Emergencies (Cabinet Office, 2017).	
Technological or Manmade Hazards	Malicious Attacks	Infrastructure	Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. Attempts were made to attack electricity substations in the 1990s. Bishopsgate, in the City of London, was attacked in 1993 and South Quay in London's Docklands in 1996. These attacks resulted in significant damage and disruption but relatively few casualties. The Proposed Scheme has security fencing around the site and controlled access with 24/7 security. As a COMAH and nationally important infrastructure site there is close liaison with UK security services.	N
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	Bridge works are not proposed as part of the Proposed Scheme.	N
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	The Study Area associated with the Proposed Scheme does benefit from flood defences and flood storage areas. The design of the Proposed Scheme has been developed to include allowances for future climate change predictions that could result in flooding. Notwithstanding these factors, the potential risk of breech events will be considered in the EIA.	Y C, O

Major Event Group	Major Event Category	Major Event Type	Basis of Decision to Scope In / Out	Scope In and Phase?
Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse	There are no towers or masts in close proximity to the Proposed Scheme or being built as part of the Proposed Scheme.	N
Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	The Proposed Scheme does not involve demolition works to take down any significant buildings and structures.	N
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure / fire	There are no tunnel structures proposed as part of the Proposed Scheme or within the Study Area.	N

16.7. PROPOSED ASSESSMENT METHODOLOGY

16.7.1. For those MA&D major event types which have been scoped in for detailed assessment in the ES, the proposed assessment process which will be used in the ES will include:

- Identifying potential risk events related to the scoped in major event types;
- Screening these risk events, e.g. to remove unrealistic worst case scenarios;
- Defining the likely worst-case consequences (Impact);
- Assessing the likelihood; and then
- Determining whether the risk event could be a MA&D and if relevant, whether the risk is ALARP with the proposed Mitigation Measures.

16.8. ASSESSMENT LIMITATIONS AND ASSUMPTIONS

16.8.1. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The design of the Proposed Scheme will take into consideration the relevant potential Mitigation Measures.
- The design of the Proposed Scheme will be subject to relevant Hazard Identification (HAZID) / road safety studies and actions identified integrated into the final design to reduce risks to ALARP.
- The construction stage(s) of the Proposed Scheme will be managed through the implementation of the Construction Phase Plan (required under the CDM Regulations 2015) and CEMP.
- The Proposed Scheme is being designed and its implementation guided by other industry standards and codes, many of which are mandatory. These require infrastructure and systems to be designed so that risks to people and the environment are either eliminated or reduced to levels that are ALARP.
- It is considered highly unlikely that the Proposed Scheme would be demolished after its design life as many such projects are able to operate past the initial design life through implementation of planned asset maintenance and management programmes, therefore the demolition of the Proposed Scheme is scoped out.
- Environmental effects associated with unplanned events that do not meet the definition of a Major Accident and / or Disaster (e.g. minor leaks and spills that may be contained within the construction sites are addressed in other topic chapters as appropriate and not in this section).
- It is also recognised that the management framework for the Proposed Scheme is not fully defined at this stage; however, a presumption of standard practice and regulatory compliance within the adopted management framework has been assumed and will be developed following the appointment of the principal contractor.

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17. CUMULATIVE EFFECTS

17.1. INTRODUCTION

17.1.1. The Environmental Statement (ES) will assess the potential for significant cumulative environmental effects as a result of the Proposed Scheme.

17.1.2. In line with Schedule 4, paragraph 5(e) of the Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (the EIA Regulations) the ES will consider *'the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources*.' In accordance with the EIA Regulations, the Planning Inspectorate's Advice Note 17**.** and other best practice guidance the following types of Cumulative Effects will be considered within the ES:

- Intra-project combined effects – the interaction and combination of different residual (post-mitigation) environmental effects of the Proposed Scheme affecting the same Receptor; and
- Inter-project Cumulative Effects – the combined residual (post-mitigation) environmental effects of the Proposed Scheme with a committed project (or projects) affecting the same Receptor.

17.2. PROPOSED ASSESSMENT METHODOLOGY

17.2.1. There is no widely accepted methodology or best practice for the assessment of Cumulative Effects, although there are several guidance documents available, including PINS Advice Note 17 (Cumulative Effects Assessment),which will inform the approach taken to Cumulative Effects. The approach that will be adopted is based on previous experience at WSP, the types of Receptors being assessed and the nature of the Proposed Scheme.

17.2.2. The assessment will be qualitative and based on the available information. However, partially quantitative assessments may be undertaken for traffic-related effects, for air quality and noise. Where information is not available, assumptions will be made based on professional judgement and clearly stated alongside any uncertainty as part of the assessment.

INTRA-PROJECT COMBINED EFFECTS

17.2.3. The approach to the assessment of intra-project combined effects will consider the changes in baseline conditions at common sensitive Receptors. It will be based on the information and Study Areas within the technical chapters. It will consider residual effects only.

STEP 1 – SCREENING

17.2.4. A screening exercise will be undertaken to determine whether a sensitive Receptor is exposed to more than one type of residual effect during the Construction and Operational Phases of the Proposed Scheme. Sensitive Receptors exposed to two or more residual effects will be taken forward into Stage 2 of the assessment.

STEP 2 – ASSESSMENT OF INTRA-PROJECT COMBINED EFFECTS

17.2.5. A qualitative assessment of the overall significance of the Cumulative Effects on sensitive Receptors identified at Stage 1 will be undertaken. The assessment will be based on information provided within the technical chapters, as well as professional judgement.

Inter-project Cumulative Effects

17.2.6. The assessment methodology for inter-project Cumulative Effects will involve the identification of incremental changes to baseline conditions likely to be caused by other relevant projects together with the Proposed Scheme.

STEP 1 – IDENTIFICATION AND EVALUATION OF PROJECTS FOR CONSIDERATION

17.2.7. Relevant projects will be identified through an initial search of the local planning authorities' planning registers, the Planning Inspectorate's planning register and local plans. Other reasonably foreseeable projects will also be identified. Based on professional judgement, the initial search will be based on a search area of 15 km for Nationally Significant Infrastructure Projects (NSIPs) and 2 km for other projects. This will create a 'long-list' of projects for consideration (corresponding with Stage 1 in PINs Advice Note 17). The following selection criteria will be applied:

- Projects that are under construction;
- Permitted application(s) within the last five years that are not yet implemented;
- Submitted applications(s) not yet determined;
- Projects on the Planning Inspectorate's Programme of Projects;
- All refusals subject to appeal procedures not yet determined; and
- Projects identified in the relevant development plan (and emerging development plans); and
- Other plans and programmes (as appropriate) which set out the framework for future development consents/approvals, where such development is reasonably likely to come forward.

17.2.8. Each of the projects identified will then be evaluated to determine whether the following criteria are met:

- Is there a concurrent Construction or Operational Phase with the Proposed Scheme?
- Is there potential that the Proposed Scheme shares common sensitive Receptors with the project?
- The project has environmental assessment information that is publicly available. Projects that have no environmental assessment information will not generally be considered.

17.2.9. Following the above review, the results will be filtered to identify suitable projects to be taken forward to the inter-project cumulative assessment. At this point in the process, a short-list of projects to be assessed will be identified (corresponding with Stage 2 of PINs Advice Note 17). The criteria will be as follows:

- Residential developments must comprise 200+ dwellings and lie within 1 km of the Proposed Scheme;
- Nationally significant infrastructure projects must lie within 5 km of the Proposed Scheme, with the exception of projects proposed by the Zero Carbon Humber Partnership (discussed further below);
- Retail or commercial developments must be over 500 sqm and within 1 km of the Proposed Scheme;
- Mineral and waste developments must be within 1 km of the Proposed Scheme; and
- Transport and infrastructure developments must be within 1 km of the Proposed Scheme.

17.2.10. Professional judgement has been applied to develop the above criteria. It is not anticipated that projects outside of the criteria set out above would give rise to greater or different likely significant effects together with the Proposed Scheme. However, professional judgement may be applied to support the exclusion of projects which exceed the thresholds, but which may not give rise to discernible Cumulative Effects on Receptors, and vice versa. The reasons for including or excluding each project will be clearly stated.

17.2.11. At this stage it is anticipated that the inter-project Cumulative Effects assessment will include the infrastructure required for transport and storage of the carbon dioxide capture by the Proposed Scheme, which will be subject to separate consents, Drax Repower and projects proposed by the Zero Carbon Humber Partnership where information is available, and subject to it becoming clear any of those projects cannot or will not proceed.

17.2.12. The Zero Carbon Humber Partnership refers to a consortium of leading energy and industrial companies with a shared vision to transform the Humber region

into the UK's first net-zero carbon cluster by 2040. Projects within the Zero Carbon Humber cluster include the Hydrogen to Humber Saltend Project, a pipeline network developed by National Grid Ventures, Centrica Storage's Easington site and Keadby 3, amongst others.

STEP 2 – IDENTIFICATION OF COMMON RECEPTORS

17.2.13. A list of common sensitive Receptors will be prepared by identifying Receptors which are listed as one of the five Receptor categories set out in Regulation 5(2) of the EIA Regulations. This corresponds with Stage 3 of PINs Advice Note 17).Once identified, the specific Receptors will then be evaluated to ensure that inter-project Cumulative Effects are duly considered at the Receptor level and that a more detailed level of assessment is only undertaken where there is a common sensitive Receptor and a likely effect.

STEP 3 – ASSESSMENT OF INTER-PROJECT CUMULATIVE EFFECTS

17.2.14. The approach to the assessment of inter-project Cumulative Effects will consider the deviation from the baseline conditions at common sensitive Receptors as a result of changes brought about due to the Proposed Scheme in combination with one or more other projects. This step corresponds with Stage 4 of PINs Advice Note 17 (Planning Inspectorate, 2019)).

17.2.15. The assessment of the inter-project Cumulative Effects will be based upon the residual effects identified in the technical chapters of the ES, as well as available environmental information for the approved developments.

17.2.16. The qualitative evaluation at the Receptor level will consider the following:

- Combined magnitude of change;
- Sensitivity / value / importance of the Receptor / receiving environment to change; or / and
- Duration and reversibility of effect.

17.2.17. Through a combination of the qualitative evaluation presented in the ES, conclusions will be drawn as to the likelihood for significant inter-project cumulative environmental effects (over and above, or different to, those identified for the Proposed Scheme on its own). The ES will describe measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant Cumulative Effects and, where appropriate, any proposed monitoring arrangements. The means of securing delivery of these measures will be explained.

17.2.18. For projects within Zero Carbon Humber cluster, common sensitive Receptors and their possible associated inter-project Cumulative Effects are anticipated to include:

- Beneficial effects on the region's working population – the construction phases of the Zero Carbon Humber projects are currently expected to occur

on similar timescales. This would lead to increased employment in the region during this period.

- Beneficial effects on climate – the operation of projects within the Zero Carbon Humber cluster would lead to a regional reduction in regional carbon dioxide emissions.
- Adverse effects on the region's air quality – if multiple post-combustion carbon capture projects are constructed as part of the Zero Carbon Humber cluster there could be increases in some air pollutants.

17.2.19. The inter-project Cumulative Effects of the Proposed Scheme and projects within the Zero Carbon Humber cluster will be assessed further in the Preliminary Environmental Information Report (PEIR) and ES when more information is available.

17.3. LIMITATIONS AND ASSUMPTIONS

17.3.1. The assessment of intra-project combined effects resulting from the Proposed Scheme will be focused on the residual effects from the Construction and Operational Phases following the implementation of Mitigation Measures that are secured through DCO requirements or other mechanisms.

17.3.2. The assessment of inter-project Cumulative Effects will be based on the interpretation and assessment of data provided by third parties and limited by the level of information available. In instances where no information is available then no cumulative assessment will be undertaken.

17.4. REFERENCES

- Planning Inspectorate. (2019). Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects.

18. SUMMARY

18.1. SCOPE OF THE EIA

18.1.1. It is proposed that the following environmental topics are included in the scope of the EIA:

- Population, Health and Socioeconomics;
- Transport;
- Air Quality;
- Noise and Vibration;
- Ecology;
- Landscape and Visual Impact;
- Historic Environment;
- Ground Conditions;
- Water Environment;
- Materials and Waste;
- Greenhouse Gases; and
- Major Accidents and Disasters.

18.1.2. One environmental topic, 'Climate Change Resilience', is proposed to be scoped out of the ES, as set out within Chapters 4. Furthermore, the assessment of 'Heat and Radiation' and 'Navigational Risk Assessment' are also proposed to be scoped out, as set out in Chapter 3.

18.1.3. The topic-specific matters scoped in and out of further assessment are detailed within Chapters 4 to 16 and a table summarising each of the topic-specific matters scoped out of the ES are shown in Table 18.1 below.

Table 18.1 - Impacts Scoped Out of Further Assessment

Topic	Impact	Phase
Climate Change Resilience	Impacts from climate change on the construction of the Proposed Scheme	Construction
	Impacts from climate change on the operation of the Proposed Scheme	Operation
Population, Health and Socioeconomics;	Increased demand for accommodation and community facilities due to an influx of workers	Construction

Topic	Impact	Phase
	Crime and Safety	Construction and Operation
	Private Property and Housing	Construction
	Changes in Access to Community Land and Assets	Construction
	Development Land and Businesses	Construction
	Agricultural Land holdings	Construction and Operation
	Health	Construction and Operation
Transport	n/a	
Air Quality	Emissions of nitrogen oxides (NOX) and PM10 from construction vehicles leaving and accessing the Proposed Scheme, and construction plant	Construction
	Emissions of nitrogen oxides (NOX) and PM10 from operational vehicles leaving and accessing the Proposed Scheme	Operation
Noise and Vibration	Development generated vibration	Operation
	Transportation related noise and vibration impacts arising from the operation of the Proposed Scheme	Operation
Ecology	Loss or disturbance of common and widespread habitats of negligible nature conservation importance	Construction and Operation
	Temporary disturbance of common and widespread species of negligible nature conservation importance	Construction and Operation

Topic	Impact	Phase
Landscape and Visual Impact	n/a	
Historic Environment	n/a	
Ground Conditions	Impacts to future users, third party neighbours, potable water supply and plants from contamination within the underlying soils / groundwater.	Operation
Water Environment	n/a	
Materials and Waste	Impacts associated with the extraction of raw resources and the manufacture of products	Construction and Operation
	Consumption of material resources associated with the Proposed Scheme during the first year of operation	Operation
	Disposal and recovery of waste associated with the Proposed Scheme beyond the first year of operation	Operation
	Impacts resulting from the transportation of material resources and waste to and from the Proposed Scheme	Construction and Operation
	Impacts and effects on human health and Controlled Waters as a result of contaminated site arisings from the Proposed Scheme	Construction and Operation
Greenhouse Gases	Disposal of waste	Construction
	Land use, land use change and forestry	Construction

Topic	Impact	Phase
	A5	
	Electricity used for lighting B1	Operation
	Maintenance B2-5	Operation
	Repair B2-5	Operation
	Land use, land use change and forestry B8	Operation
Major Accidents and Disasters	Natural hazards – hydrology – fluvial flooding	Construction and Operation
	Natural hazards – hydrology – pluvial flooding	Construction and Operation
	Natural hazards – hydrology – groundwater flooding	Construction and Operation
	Technological or manmade hazards – industrial and urban accidents – Major Accident Hazard chemical sites	Construction and Operation
	Technological or manmade hazards – industrial and urban accidents – fires	Construction
	Technological or manmade hazards – transport accidents – road	Construction
	Technological or manmade hazards – transport accidents – waterways	Construction
	Technological or manmade hazards – pollution accidents – land	Operation

Topic	Impact	Phase
	Technological or manmade hazards – pollution accidents – water	Construction and Operation
	Technological or manmade hazards – engineering accidents and failures – flood defence failure	Construction and Operation

APPENDIX A – MAD – SCOPING RECORD

Major Event Group	Major Event Category	Major Event Type	Topic chapter(s) with relevant information	Relevant to Scheme Area?	Phases which exacerbate vulnerability	Potential Receptors	Basis of Decision to Scope In/Out	Scope In?
Natural Hazards	Geophysical	Earthquakes	Chapter 2 – Site and Project Description	N	N/A	N/A	Do not occur in Britain of a sufficient intensity owing to the motion of the Earth's tectonic plates causing regional compression. Uplift from the melting of the ice sheets that covered many parts of Britain thousands of years ago can also cause movement. The BGS acknowledges that on average, a magnitude 4 earthquake happens in Britain roughly every two years and a magnitude 5 earthquake occurs around every 10 to 20 years. As such, the Cabinet Office National Risk Register of Civil Emergencies states that "Earthquakes in the UK are moderately frequent but rarely result in large amounts of damage. An earthquake of sufficient intensity (determined on the basis of the earthquake's local effect on people and the environment) to inflict severe damage is unlikely". Proposed Scheme not in or close to an active area.	N
Natural Hazards	Geophysical	Volcanic Activity	Chapter 2 – Site and Project Description	N	N/A	N/A	Proposed Scheme is not in an active area and highly unlikely that an ash cloud could significantly impact on any aspect of the Proposed Scheme.	N
Natural Hazards	Geophysical	Landslides	Chapter 12 – Ground Conditions	N	N/A	N/A	Historical landslides have not been recorded within the boundary of the Proposed Scheme and the Proposed Scheme does not involve the formation of deep cuts/high embankments.	N
Natural Hazards	Geophysical	Sinkholes	Chapter 12 – Ground Conditions	N	N/A	N/A	This is likely to be covered in the geotechnical design, and there are no examples of areas that have been affected by sinkholes in the locality to warrant taking this event forward.	N
Natural Hazards	Geophysical	Tsunamis	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme is located inland, outside a tsunamis risk zone.	N
Natural Hazards	Hydrology	Coastal Flooding	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme is located inland, outside a coastal area.	N
Natural Hazards	Hydrology	Fluvial Flooding	Chapter 13 – Water Environment	Y	C,O	Aquatic environment and ecological receptors Properties Public and local community	Environment Agency Flood Map for Planning (Rivers and Sea) indicates that the northern and southern part of the Drax Power Station Site, Carr Lane, Redhouse land and the area of the existing jetty are located in the high risk Flood Zone 3 but benefit from the existing flood defences on the River Ouse. Flood Zone 3 is described as land assessed as having a 1 in 100 or greater annual probability of flooding from river or a 1 in 200 or greater annual probability of flooding from see in any year. The risk of flooding in this area is associated with the River Ouse, which is tidally influenced at this location, with minor fluvial contributions. There is a risk of breach of flood defences.	Y
Natural Hazards	Hydrology	Pluvial Flooding	Chapter 13 – Water Environment	Y	C,O	Aquatic environment and ecological receptors Properties Public and local community	A review of the Environment Agency's Flood Risk from Surface Water map shows isolated areas within the area of the Proposed Scheme to be at low to high risk of flooding from surface water. Surface water flooding is likely to be associated with localised depressions where water will pond during or after prolonged rainfall events.	Y

Natural Hazards	Hydrology	Groundwater Flooding	Chapter 12 – Ground Conditions	Y	C,O	Aquatic environment and ecological receptors Properties Public and local community	As part of Drax Repower Project, the Selby Internal Drainage Board advised that high groundwater levels occur in the area of the Proposed Scheme. Risk of flooding from groundwater will be assessed as part of the Flood Risk Assessment which will be supporting the Environmental Impact Assessment (EIA).	Y
Natural Hazards	Hydrology	Avalanches	Chapter 2 – Site and Project Description	N	N/A	N/A	Not considered relevant given the geographical location of the Proposed Scheme. The Proposed Scheme's topography is relatively flat and therefore an avalanche will not occur.	N
Natural Hazards	Climatological and Metrological	Cyclones, hurricanes, typhoons, storms and gales	Chapter 2 – Site and Project Description	Y	N/A	Workers	Cyclones, hurricanes and typhoons do not occur in the UK. The winter of 2015/2016 was the second wettest winter on record and a series of storms (including 'Desmond' and 'Eva') resulted in heavy and sustained rainfall. 17,600 UK properties were flooded and several bridges collapsed, disrupting access to and from local communities. According to the latest five year meteorological data (2002 - 2016) from RAF Waddington , the greatest wind speed recorded was 66 km/h. The RAF Waddington site is located more than 60 km south of Drax and therefore a review of wind speeds during 2009-2012 from the closest weather station to Drax at Church Fenton, decommissioned in 2013, identified a maximum wind speed of 76 km/h. Storms and gales could result in damage to new site infrastructure, property and works on site. However, it is anticipated that the risk of vulnerability to MA&D event for the Proposed Scheme would be comparable to that for the existing Drax Power Station and design standards would take into account these weather conditions.	N
Natural Hazards	Climatological and Metrological	Thunderstorms	Chapter 2 – Site and Project Description	Y	N/A	Workers	This type of event could result in lightning strikes to temporary elevated structures during construction (e.g. tower cranes) and new elevated structures (such as columns, chimney stacks and cooling towers) introduced as part of the Proposed Scheme; however, the risk is no different to similar elevated structures on site. New elevated structures will be designed taking into historical site experience and current design standards taking into account climate change resilience. Specific measures are therefore not considered to be required as part of the Proposed Scheme.	N
Natural Hazards	Climatological and Metrological	Wave surges	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme is located sufficiently inland, and therefore is not subject to wave surges.	N

Natural Hazards	Climatological and Metrological	Extreme temperatures: Heatwaves Low (sub-zero) temperatures and heavy snow	Chapter 2 – Site and Project Description Chapter 12 – Ground Conditions	Y	N/A	N/A	This type of event could give rise to changes in climatic conditions, with site infrastructure exposed to greater heat intensity and exposure to sunlight. Heavy snow could cause workers and delivery vehicles and drivers to be trapped. In August 1990, the UK experienced heatwave conditions with temperatures reaching what was then a record 37.1°C in Cheltenham, England. In August 2003 a UK heatwave lasted 10 days and resulted in over 2,000 deaths. High temperature records are now being broken with increasing frequency. The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010. Daytime temperatures were mostly sub-zero across the UK. At night, temperatures in England regularly fell to -5°C to -10°C. Snowfall across the UK lasted for some time, allowing 20cm to 30cm of snow to build up, closing schools and making it very difficult to travel. Between 1981 and 2010, there were 12 occurrences where summer mean temperatures exceeded 25.2°C on five or more consecutive days. Between 1981 and 2010, there have been 1,368 days with a maximum minimum temperature below zero degrees Celsius. Between 1981 and 2010, there were 229 days with snow lying at 0900 however, there are no records from the Met Office of the depth of snow. However, the risk is no different to those for the existing Drax Power Station.	N
Natural Hazards	Climatological and Metrological	Droughts	Chapter 12 – Ground Conditions Chapter 13 – Water Environment	Y	C,O	N/A	Over the past 40 years or so England has experienced five long-duration droughts and two shorter periods of drought. During the 2010-12 drought, parts of eastern England recorded their lowest 18 month rainfall total in over 100 years. Between April 2010 and March 2012, the Drax area only received 65-85% of rainfall compared with the 1981-2010 average. There was a drought in 1995-1996 which affected the area of the Proposed Scheme However, the Proposed Scheme should not be vulnerable to drought as water is not an essential service during the construction, use or maintenance phases. The design of the sub-structure will be resilient to ground shrinkage and should remain in the design risk register until designed out.	N
Natural Hazards	Climatological and Metrological	Severe Space Weather: Solar Flares	Chapter 2 – Site and Project Description	N	N/A	N/A	Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. There will be the use of technology to control processes and plant, however this is protected, therefore the Proposed Scheme is no more vulnerable than the existing systems on site.	N
Natural Hazards	Climatological and Metrological	Severe Space Weather: Solar Energetic Particles	Chapter 2 – Site and Project Description	N	N/A	N/A	Solar energetic particles which cause solar radiation storms, but only in outer space, so this major event type can be scoped out.	N
Natural Hazards	Climatological and Metrological	Severe Space Weather: Coronal Mass Ejections	Chapter 2 – Site and Project Description	N	N/A	N/A	Coronal mass ejections (CME) cause geomagnetic storms. The geomagnetic storm in 2003 caused the UK aviation sector to lose some GPS functions for a day, however there were no known significant impacts on road users or infrastructure.	N
Natural Hazards	Climatological and Metrological	Fog	Chapter 2 – Site and Project Description	N	N/A	N/A	Fog is one of the most common weather conditions in the UK, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50m over a wide area. The majority of the work on the Proposed Scheme is within the Drax Power Station site where vehicle speed is controlled to below 10 mph.	N
Natural Hazards	Climatological and Metrological	Wildfires: Forest fire, Bush/brush, pasture	Chapter 2 – Site and Project Description	N	N/A	N/A	In April and May 2011 numerous wildfires broke out across the UK after unusually hot and dry weather. England received only 21% of its usual rainfall for April 2011. The Proposed Scheme and surrounding area does not contain vegetation with a potential high fuel load such as gorse.	N

Natural Hazards	Climatological and Metrological	Poor Air Quality	Chapter 7 – Air Quality	Y	C	N/A	In 2006 the UK experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. In the spring of 2015, two particle pollution episodes caused widespread poor air quality throughout the UK, with multiple areas measuring 'High' on the Daily Air Quality Index and resulted in around 1,100 deaths due to exacerbation of pre-existing ill-health conditions. Summer 2015 also contained two elevated ozone episodes. **Construction**: Construction effects would be temporary for the duration of the construction phase. Increased dust emissions from construction activities and traffic could lead to potential loss of amenity at sensitive receptors. Traffic management measures may result in both positive and adverse changes to emissions from vehicle exhausts and roadside pollution concentrations. **Operation**: The Proposed Scheme is expected to result in changes to emissions of amines and ammonia which require a variation to the site's existing environmental permit. In the determination of the proposed variation to the permit, the Environment Agency will set emission limits on amines and ammonia to air together with requirement to implement appropriate mitigation measures to prevent harm to environmental receptors. Therefore, significant residual air quality effects which could result in a MAD event are not anticipated during construction and operation of the Proposed Scheme.	N
Natural Hazards	Biological	Disease epidemics: - Viral - Bacterial - Parasitic - Fungal - Prion	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme is located in a developed country where the population is in general good health. Furthermore, the use of the Proposed Scheme is not going to give rise to any disease epidemics. Public Health England, the executive agency of the Department of Health is responsible for protecting the nation from public health hazards, preparing for and responding to public health emergencies. One of Public Health England's functions is to protect the public from infectious disease outbreaks and the Agency has produced a document providing operational guidance for the management of outbreaks of communicable disease, 'Communicable Disease Outbreak management: Operational Guidance'.	N
Natural Hazards	Biological	Animal Diseases: - zoonotic: • avian influenza • West Nile virus • Rabies - non-zoonotic: • foot and mouth • swine fever	Chapter 12 – Ground Conditions	N	N/A	N/A	Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last 10 years, most recently in the winter of 2016/17, although with no human cases reported. There was a devastating foot and mouth outbreak in 2001. Scoped out as the use of the Proposed Scheme is not going to be the source of any disease epidemics and spread would be controlled through containment of infected animals including prohibition of transportation.	N
Natural Hazards	Biological	Plants	Chapter 9 – Ecology	N	C		Standard control measures would be implemented by the appointed contractor during construction to handle and dispose of any diseased plants and/or injurious weeds and prevent their spread.	N
Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead to violence and loss of life.	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts. The Proposed Scheme is not considered highly controversial and should not lead to high profile public demonstrations.	N
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	Chapter 2 – Site and Project Description Chapter 5 – Population, Health and Socio economics	N	N/A	N/A	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N

Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	Chapter 2 – Site and Project Description Chapter 5 – Population, Health and Socio economics	N	N/A	N/A	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	Chapter 2 – Site and Project Description Chapter 5 – Population, Health and Socio economics	N	N/A	N/A	The Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Significant security risks for humanitarian relief workers in some areas.	Chapter 2 – Site and Project Description Chapter 5 – Population, Health and Socio economics	N	N/A	N/A	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Famine	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme is located in a developed country that produces its own crops and imports food. It is politically stable and not subject to hyperinflation and therefore food is available, whether produced within the UK or imported. Famine is also not relevant to the use of the Proposed Scheme.	N
Technological or Manmade Hazards	Societal	Displaced population	Chapter 2 – Site and Project Description Chapter 5 – Population, Health and Socio economics	N	N/A	N/A	There will be no significant displacement of populations as part of the Proposed Scheme.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical sites		Y	C,O	Aquatic environment and ecological receptors Public and local community Workers	There are no other Control of Major Accident Hazard (COMAH) sites within 5km of the Drax Power Station site other than Drax Power Station itself, which is currently a lower tier establishment. The COMAH establishment is legally required to assess any additional risk introduced by development within its outer zone and implement measures to reduce those risks to it to be As Low As Reasonably Practicable (ALARP). Therefore it is proposed than no further evaluation in the ES is required on the COMAH establishment as as an initiator of a MA&D event on the Proposed Scheme, however further evaluation of an event in the Proposed Scheme triggering a domino effect on the COMAH establishment should be further evaluated in the ES.	Y
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines		Y	C	N/A	A known proposed gas pipeline associated with the Knottingley Power Project has been identified within the Local Authority area however; the proposed route of the pipeline is a significant distance from the Proposed Scheme and will not impact the construction or operation of the Proposed Scheme. As part of the Drax Repower DCO application, a natural gas pipeline has been approved to be run to the site. However, the proposed route is sufficiently distanced from the proposed works on the road from the quay to site and BECCS works on the site. Once the pipeline is operational, if work was to be required within its consultation zone then it would be legally required to be demonstrated as ALARP under existing H&S legislation before being allowed to take place.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear		N	N/A	N/A	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. Last historical major accident in the UK was Windscale in 1957. No nuclear sites within a 5km corridor along the Proposed Scheme.	N

Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	Chapter 2 – Site and Project Description	N	O	Workers Road Users	In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England. The surrounding area was temporarily evacuated and some local businesses experienced long-term disruption to operations. There are no bulk fuel storage sites within the study area.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	Chapter 13 – Water Environment	Y	C,O	N/A	Dam breaches in the UK are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding. Environment Agency Flood Risk from Reservoirs map indicates that the northern and southern part of the Drax Power Station site, and the northern part of the proposed laydown area, is at risk of flooding from reservoirs.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	Chapter 12 – Ground Conditions	Y	C	Workers	The Coal Authority interactive map indicates that the area to the north of the existing Drax Power Station site is within a Coal Mining Reporting Area. However, online maps indicate that there are no known mines / openings in the area. The majority of the work will be on the Drax Power Station site close to existing structures and there is no historical evidence of subsidence.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	Chapter 2 – Site and Project Description Chapter 5 – Population, Health and Socio economics Chapter 11 – Historic Environment	Y	C,O	Cultural heritage sites People Road users	**Construction:** Fires could be initiated by construction related activities which impact areas adjacent to the construction activities such as the lower tier COMAH installation. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. **Operation:** There are no significantly sized urban buildings in close proximity of the Proposed Scheme structures. Notwithstanding this, the risk of fires affecting the Proposed Scheme from offsite urban developments during operation is no greater than risks for Drax Power Station.	Y
Technological or Manmade Hazards	Transport accidents	Road	Chapter 6 – Transport Chapter 12 – Ground Conditions	Y	C	Aquatic environment and ecological receptors Properties Workers Road users	Significant transport accidents occur across the UK on a daily basis, mainly on roads, and involving private and/or commercial vehicles. During construction there will be an increase in heavy construction plant and equipment on local road network which may increase the risk of accidents.	Y
Technological or Manmade Hazards	Transport accidents	Rail	Chapter 12 – Ground Conditions Chapter 13 – Water Environment	Y	C,O	N/A	The only railway within the Proposed Scheme area is that used for transporting coal and renewable fuel to the site from the Humber Port. The Proposed Scheme does not involve use or modification of the railway. Therefore, vulnerability of the Proposed Scheme to the risk of MA&D events related to rail transportation are not anticipated during construction and operation of the Proposed Scheme.	N
Technological or Manmade Hazards	Transport accidents	Waterways	Chapter 2 – Site and Project Description	Y	C	Aquatic environment and ecological receptors Waterway Users	It is proposed to us the River Ouse to transport construction materials by water from the Humber. It understood at his time that discussions have been held between Wynns (transport contractor) and Humber Port Authorities to gain consent for the movements and in principle received. However, the detailed conditions and requirements will not be finalised until mid - 2021. Therefore, until further information is available it is proposed to scope in for further evaluation in the ES.	Y
Technological or Manmade Hazards	Transport accidents	Aviation	Chapter 2 – Site and Project Description	N	N/A	N/A	There have been no major air accidents in the UK since the Kegworth incident in 1989. There are no working airfields within the Study Area.	N

Technological or Manmade Hazards	Pollution accidents	Air	Chapter 7 – Air Quality	Y	C,O	N/A	**Construction**: Construction effects would be temporary for the duration of the construction phase. Increased dust emissions from construction activities and traffic could lead to potential loss of amenity at sensitive receptors. Traffic management measures may result in both positive and adverse changes to emissions from vehicle exhausts and roadside pollution concentrations. Emissions from mobile plant and equipment covered under H&S and environmental legislation **Operation**: The Proposed Scheme is expected to result in changes to emissions of amines and ammonia which require a variation to the site's existing environmental permit. In the determination of the proposed variation to the permit, the Environment Agency will set emission limits on amines and ammonia to air together with requirement to implement appropriate mitigation measures to prevent harm to environmental receptors. Therefore, significant residual air quality effects which could result in a MA&D event are not anticipated during construction and operation of the Proposed Scheme, and it is therefore it proposed not to evaluate this further in the ES.	N
Technological or Manmade Hazards	Pollution accidents	Land	Chapter 12 – Ground Conditions Chapter 13 – Water Environment	Y	C	Ecological receptors Local heritage Public and local community	During construction there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks. During operation, it is understood that a range of new hazardous wastes may be generated and stored on site before going offsite for treatment, however quantities and characteristics are not fully known at this time. Therefore, it is proposed to be scoped in for further evaluation in the ES when more information is known.	Y

Technological or Manmade Hazards	Pollution accidents	Water	Chapter 12 – Ground Conditions Chapter 13 – Water Environment	Y	C,O	Public and local community Water environment	The majority of the Proposed Scheme is underlain by the Hemingbrough Glaciolacustrine Formation (Unproductive) with pockets of Breighton Sand Formation (Secondary A Aquifer) present in places. Furthermore, the areas adjacent to the River Ouse (north of the Proposed Scheme and the existing Drax Jetty) are underlain by Alluvium (Secondary A Aquifer). The Environment Agency defines Secondary A Aquifers as 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. Unproductive strata are defined by the Environment Agency as having low permeability with negligible significance for water supply or river base flow. The groundwater vulnerability map supplied by DEFRA shows the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a single square kilometre. The groundwater vulnerability map indicates that Drax Power Station site has 'low' to 'medium' vulnerability whilst the areas which are underlain by Alluvium superficial deposits i.e. north of the Proposed Scheme and the existing Drax Jetty have 'medium – high' vulnerability. The EA's Groundwater Source Protection Zone (SPZ) mapping shows that the vast majority of the Drax Power Station site, southern part of the proposed laydown area, Carr Lane and western section of Redhouse Lane are located in Zone 3 of the groundwater SPZ. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. SPZs are typically used to protect abstractions for public water supply. The northern part of the Drax Power Station site, including the area of the existing 'woodyard' laydown area, the northern section of the proposed laydown area and the area of the existing jetty are not located in the groundwater SPZ. During construction there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.	Y
Technological or Manmade Hazards	Utilities failures	Electricity	Chapter 2 – Site and Project Description	Y	C	Workers	Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. These tend of be mainly specific place, local (e.g. metropolitan area) and less frequently regional (e.g. North East) as a result of severe winter storms and consequent damage to the distribution overhead line network. Above-ground electrical transmission lines are present within the Site Boundary, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail. Information regarding diversion works will be considered in the Environmental Impact Assessment. The potential risk of construction-related incidents when undertaking diversion works and work close to key electrical infrastructure as part of the Proposed Scheme would be covered by existing legislation to manage and control risk events to be ALARP.	N

Technological or Manmade Hazards	Utilities failures	Gas	Chapter 2 – Site and Project Description	N	C,O	N/A	Underground and above-ground gas transmission pipelines are currently not present in the Site Boundary. Looking ahead, as part of the Drax Repower Project, a high pressure natural gas pipeline has been approved for connecting the site to the national grid. However, its proposed route is sufficient distanced from the work related to this Proposed Scheme that it is proposed that further evaluation in the ES is not required.	N
Technological or Manmade Hazards	Utilities failures	Water supply		N	N/A	N/A	There is a water supply connection at Drax Power Station. However, there are no connections in the Study Area which are believed to be significant enough to increase the vulnerability of the Proposed Scheme to a MA&D event.	N
Technological or Manmade Hazards	Utilities failures	Sewage system		N	N/A	N/A	No use of the sewage system is associated with the Proposed Scheme. During the construction phase, temporary portable systems will be in place covered by H&S welfare requirements.	N
Technological or Manmade Hazards	Malicious Attacks	Unexploded Ordnance	Chapter 12 – Ground Conditions	N	N/A	N/A	A low potential exists for encountering unexploded ordnance during construction of the Proposed Scheme. Measures would be undertaken during construction to brief operatives to raise awareness of this issue, and to define appropriate response strategies should this be discovered during the works.	N
Technological or Manmade Hazards	Malicious Attacks	Attacks Chemical Biological Radiological Nuclear		N	N/A	N/A	Extremists remain interested in Chemical, Biological, Radiological and Nuclear (CBRN) materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Historical use has been in closed densely occupied structures (underground, buildings) or targeted at specific individuals. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Transport systems		N	N/A	N/A	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Crowded places		N	N/A	N/A	The Proposed Scheme does not fall within the definition of a crowded place, i.e. pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Cyber		Y	O	N/A	Cyber attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. The increasing reliance on technology to control the carbon capture and storage processes and plant could render the Proposed Scheme more vulnerable to a cyber-attack. Notwithstanding this, it is not considered to be more vulnerable to attack than existing processes and plant on site and similar infrastructure installed and running on the UK power network. Drax is accountable to the Secretary of State for Business, Energy and Industrial Strategy for ensuring the resilience of their strategic power generator stations and network to national security risks, including from terrorism, cyber-attack, natural hazards and other risks outlined in the National Risk Register of Civil Emergencies.	N

Technological or Manmade Hazards	Malicious Attacks	Infrastructure	Chapter 2 – Site and Project Description	N	N/A	N/A	Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. Attempts were made to attack electricity substations in the 1990s. Bishopsgate, in the City of London, was attacked in 1993 and South Quay in London's Docklands in 1996. These attacks resulted in significant damage and disruption but relatively few casualties. The Proposed Scheme has security fencing around the site and controlled access with 24/7 security. As a COMAH and nationally important infrastructure site there is close liaison with UK security services.	N
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	Chapter 2 – Site and Project Description	N	N/A	N/A	Bridge works are not proposed as part of the Proposed Scheme.	N
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	Chapter 13 – Water Environment	Y	C,O	People Property Workers	The Study Area associated with the Proposed Scheme does benefit from flood defences and/or flood storage areas. The design of the Proposed Scheme has been developed to include allowances for future climate change predictions that could result in flooding. Notwithstanding these factors, the potential risk of breech events will be considered in the Environmental Impact Assessment.	Y
Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse		N	N/A	N/A	There are no towers or masts in close proximity to the Proposed Scheme or being built as part of the Proposed Scheme.	N
Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	Chapter 2 – Site and Project Description	N	N/A	N/A	The Proposed Scheme does not involve demolition works to take down any significant buildings and structures.	N
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure/fire	Chapter 2 – Site and Project Description	N	N/A	N/A	There are no tunnel structures proposed as part of the Proposed Scheme or within the Study Area.	N