

#### 2.4.4 Access to Converter Station

Access to the proposed converter station site will be provided by a new approximately 200 m long permanent access road from the existing highway network, off New Road. This will be constructed at the beginning of the works in order that it can be used by all construction traffic and also forms part of the temporary access road to the construction compound during the construction phase (**Figure NTS-3**).

#### 2.4.5 Construction of Converter Station

The exact construction phasing and programming of some activities will depend on the appointed Contractor and detailed design, however the broad programme and main construction activities are set out in **Table 2-2**.

**Table 2-2: Indicative Converter Station Construction Programme** 

Construction Phase	Yea	ar 1		Yea	ar 2		Yea	ar 3		Yea	ar 4		Yea	ar 5	
Preliminary works															
Site establishment															
Earthworks															
Civil engineering works															
Building works															
Cable installation															
Installation of services															
Mechanical and electrical works															
Commissioning															
Reinstatement and landscaping															

The construction of the converter station will be facilitated by the temporary construction compound located immediately north of the converter station (within the same agricultural field). Access to this compound would be taken via the same proposed permanent access from New Road.

#### 2.4.6 Operation of Converter Station

Following a period of commissioning and testing, the proposed converter station will operate continuously throughout the year. The proposed converter station will be operated by a small team based on site with a minimum of two operators present at all times. During normal operation there will be approximately six personnel on site, divided between three shifts over a 24-hour period.

During maintenance (planned and unplanned) the number of personnel present on site would increase with the number of staff proportionate to the nature of the maintenance works being undertaken. The frequency of maintenance activities is dependent on the specifications/requirements of the Contractor that provides/installs the equipment.

The anticipated operational life of the proposed converter station is approximately 40 years however it is likely that plant and equipment will be refurbished to extend the operational phase further.

## 2.5 Proposed Underground AC Cable Route

Approximately 0.5 km of underground AC cables will connect the proposed converter station to the existing Drax 400 kV Substation. The cable will cross New Road into the proposed converter station site.

#### 2.5.1 Physical Characteristics

The exact configuration of the proposed AC cable route is subject to detailed design following appointment of the Contractor; however, the general characteristics as outlined below in **Table 2-3** have been used to inform the EIA. Further details are provided within ES Vol.2 (Main Report) **Chapter 3: Description of the English Onshore Scheme**.

Table 2-3: Proposed Underground AC Cable – Key Characteristics

Factor	Details
Operating voltage	400 kV
Route length	up to 500 m
Working width	This is the land required to install the cables and includes provision for the cable trench, soil storage, drainage and a haul road. It will be up to 60 m wide.
No. of cables	Six or twelve (depending on final design) high voltage AC cables.
Permanent Infrastructure	Cable markers may be installed at crossing points either side of New Road to identify the presence of the cables.
	No other necessary permanent infrastructure associated with the underground AC cable.

#### 2.5.2 Cable Installation

It is likely that installation of the proposed AC cable route will be undertaken via open cut due to the presence of a number of existing services along New Road. Installation across New Road will be phased to ensure that vehicles can pass while works are undertaken under traffic management. Installation would be undertaken within a 60 m wide working width.

The installation approach will be the same as described for the HVDC cables above, however a minimum of six ducts will be needed, one per cable.

Installation of the underground AC cables is expected to take approximately 2 months.

## 2.5.3 Operation of Underground AC Cable

As for the proposed DC cable route, operational activity along the proposed AC cable route would mainly be limited to non-intrusive inspections with a small chance of localised intrusive cable repair works being required.

# 3. Environmental Impact Assessment

#### 3.1 About Environmental Assessment

Environmental assessment is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development. It promotes the early identification and evaluation of any issues which may cause negative socio-economic impacts, harm to the environment or human health, or be a source of nuisance to local people. This enables appropriate measures to avoid, reduce or offset any significant negative effects to be put in place. This can include measures incorporated into the design of the development, or commitments to implement environmentally sensitive construction methods and practices.

The results of the environmental assessment also ensure that decision makers, such as ERYC and SDC and statutory consultees like Natural England and the Environment Agency, as well as other interested parties including local communities, are aware the types of environmental effects which may occur and the potential scale (severity) of those effects. This allows a judgement to be made as to whether the effects may be significant or not, so that they may be properly considered when the application for planning permission is being assessed.

## 3.2 Requirement for Environmental Impact Assessment

ERYC and SDC have confirmed that due to the scale and nature of the works being undertaken within their respective authority areas, that the English Onshore Scheme does legally require an EIA to be undertaken as per the EIA Regulations 2017 (Ref NTS-2).

This Non-technical Summary summarises the findings of the EIA, which is fully described in ES Vol.2, Main Report.

Further details of the EIA process can be found in ES Vol.2 (Main Report) Chapter 5: Approach to Environmental Impact Assessment.

## 3.3 Approach to Environmental Impact Assessment

#### 3.3.1 Baseline Studies

In order to assess the potential impacts resulting from the English Onshore Scheme it was necessary to first establish the environmental conditions that currently exist both within the boundary of the proposed development and within the vicinity, this is known as the baseline. The likely evolution of the baseline (possible changes in these environmental conditions) which would potentially occur if the English Onshore Scheme was not developed were also considered.

Appropriate understanding of the existing baseline for each environmental receptor was collated through some or all of the following processes:

- Undertaking baseline surveys and collecting data to establish the exiting baseline conditions;
- Review secondary data sources (i.e., review of existing documentation and literature); and
- Stakeholder consultation including local communities, statutory and non-statutory bodies.

The key data sources used to establish the baseline are described in each technical assessment chapter of the ES; where relevant, each chapter is also supported by additional background and baseline information provided within an appendix.

## 3.3.2 Assessment of Impacts

The assessment of impacts for each technical specialism has followed a clear progression. Firstly, the types of impact which could potentially occur and the receptors which could potentially feel those impacts were identified. Impacts may be beneficial (improvement on the baseline condition) or adverse (deterioration in the baseline condition).

Then the magnitude (or scale) of change to the baseline environment caused by the impact was determined, along with the sensitivity and/or value of the receptor(s). Due to the diverse range of potential impacts to consider within the assessment process a range of methods were used to define these (often using standard methodologies set out in discipline-specific guidance). When assessing the magnitude of change the assessment has taken into account that the design of the English Onshore Scheme has incorporated measures to reduce environmental impacts (such as avoiding sensitive locations) and assumed that industry standard guidance and best practice measures will be employed during construction (together these measures are commonly referred to as mitigation by design).

A standard hierarchical approach to mitigation has been used:

- 1. Avoid or Prevent: In the first instance, mitigation should seek to avoid or prevent the adverse effect at source for example, by routeing the cables away from a sensitive receptor;
- 2. Reduce: If the effect is unavoidable, mitigation measures should be implemented which seek to reduce the significance of the effect; and
- 3. Offset: If the effect can neither be avoided nor reduced, mitigation should seek to offset the effect through the implementation of compensatory mitigation.

The magnitude of change and the sensitivity and/or value of the receptor(s) was then used to determine whether the potential effects are significant or not, and whether additional project specific mitigation would be required to reduce the effects to an acceptable (non-significant) level.

In general, the classification of an effect is determined using the matrix shown in **Table 3-1**, where **Moderate** and **Major** effects are considered to be 'significant' in accordance with standard EIA practice. Where effects were identified as being of **Negligible** or **Minor** significance, these were determined to not be significant.

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

**Table 3-1: Impact Magnitude Criteria** 

Where a significant potential effect was identified, additional project specific mitigation was described and the impacts reassessed (the residual impacts) with these measures in place to ensure that a non-significant effect could be achieved.

It is noted that there are times when a significant impact cannot be mitigated. This does not necessarily prevent planning permission from being granted, but it must be demonstrated that impact has been mitigated as far as possible, and a clear case for the need of the development outweighing the impact must be made. As further described below, there are no unmitigated significant impacts as a result of the English Onshore Scheme.

#### 3.4 Cumulative Effects

For the purpose of the environmental assessment, cumulative effects are defined under two categories; intra-project effects and inter-project effects:

 Intra-Project Combined Effects: The combined effects arising as a result of the English Onshore Scheme upon a single receptor or resource. An example would be where a local resident is affected

by dust, noise and a loss of visual amenity during the construction of the scheme, with the result being a greater nuisance than each individual effect alone; and

• Inter-Project Cumulative Effects: The combined effects of the English Onshore Scheme with other relevant developments which may, on an individual basis result in no significant effects but, together (i.e., cumulatively), have a significant effect.

#### 3.5 Consultation

To ensure that the assessment, and the design of the English Onshore Scheme, take account of the views of statutory and non-statutory consultees, as well as the local communities, NGET delivered a phased approach to consultation which included completing statutory EIA Scoping and non-statutory pre-application consultation. The responses received to EIA Scoping have been acknowledged and actioned as part of the EIA and embedded within the ES in terms of the approach to the assessment and consideration of key features and sensitivities within the vicinity of the English Onshore Scheme.

The public consultation was undertaken with the aim of informing consultees about the proposed English Onshore Scheme at an early stage, to understand their views and concerns and collate their feedback. Two phases of public engagement were undertaken, public consultation in March and April 2021 (Phase 1 public consultation) and public information exhibition and events in February to March 2022 (Phase 2 public information). Due to the Covid 19 pandemic both phases of the public consultation were undertaken digitally, augmented by live chat and video sessions. In-person briefings with councillors and other stakeholders were also undertaken when safe and appropriate to do so.

In addition to the Phase 1 and 2 public consultations, landowners along the English Onshore Scheme preferred route were approached by the Project's lands team in early 2021 to organise surveys. At the same time, NGET proactively introduced the English Onshore Scheme to the wider community and stakeholders by issuing a newsletter to landowners, issuing letters to stakeholders, opening the dedicated phone number and email address, and launching the website<sup>1</sup>. This ensured that NGET effectively communicated the rationale and potential impact of the English Onshore Scheme from the outset and laid the groundwork for constructive engagement during the consultation.

To promote the consultation, NGET also contacted local parish councils and MPs directly via email and reached out to planning officers at ERYC and SDC to request permission to approach their members, which was granted

https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/segl2

## 4. Results of Environmental Assessment

#### 4.1 Introduction

The following sub-sections provide a summary of the results of each of the specialist assessments undertaken as part of the environmental assessment for the English Onshore Scheme. It is intended to highlight key sensitivities or receptors identified in undertaking baseline studies, outline the key mitigation measures which NGET has committed to and set out the effects which remain taking into account the mitigation measures.

## 4.2 Ecology and Nature Conservation

The English Onshore Scheme crosses predominantly agricultural land comprising mainly of intensively farmed arable fields, interspersed with smaller permanent grassland paddocks (used for horse and livestock grazing), which are species poor and of low ecological value.

To fully understand the ecology of the English Onshore Scheme so that any potential impacts can be properly mitigated, a staged programme of desk study and ecology field surveys was undertaken by appropriately experienced and qualified ecologists. All studies/surveys were undertaken in line with guidance and best practice.

A Preliminary Environmental Appraisal Report was undertaken at an early stage of the English Onshore Scheme. This comprised a desk-study undertaken in July 2021 to obtain records of designated sites, notable habitats and protected and notable species within 2 km of the Scoping Boundary and walkover /Phase 1 Habitat Surveys of all accessible land within 500 m of the Scoping Boundary undertaken between March and November 2021. The purpose of this high-level ecological appraisal was to establish baseline conditions and determine the presence of Important Ecological Features and potential ecological constraints so that opportunities to avoid sensitive receptors and/or requirements for mitigation could be identified. The surveys also established the requirements for further detailed protected species surveys.

A number of statutory and non-statutory nature conservation sites were identified within the potential to be influenced by the English Onshore Scheme (see **Figure NTS-8**) and steps taken to avoid these where possible, for example the siting of the landfall site and use of HDD means that the English Onshore Scheme avoids direct and indirect impacts on the nearest national designations (River Hull Headwaters Site of Special Scientific Interest (SSSI) and county designations (Hudson's Way Local Nature Reserve (LNR)). No international designations will be directly impacts by the English Onshore Scheme, however there is the potential for indirect effects to the Lower Derwent Valley Special Protection Area (SPA), Ramsar and Special Area of Conservation (SAC); River Derwent SAC and SSSI; and the Humber Estuary SPA, Ramsar and SAC.

The HVDC cable has been routed to avoid direct impacts on several SSSIs including Kiplingcotes Chalk Pit SSSI and Barn Hill Meadows SSSI. Whilst it has not been entirely possible to entirely avoid crossing the River Hull Headwaters SSSI, measures to minimise potential direct and indirect effects of the English Onshore Scheme will be adopted including the installation of the cable using non open cut methods at both the River Hull and Kelk Beck crossing locations. Habitats will be fully reinstated to the former condition and where possible enhanced.

The English Onshore Scheme also avoids direct impacts upon several Local Wildlife Sites within East Yorkshire, which were taken into account at an early stage of the design following completion of the ecological desk study. Within Section 2, east of Market Weighton the planning application boundary crosses two LWS; Granny's Attic Railway and LWS Etton-Gardham Disused Railway LWS which are located within a section of the Hudson Way Local Nature reserve. Non open cut installation measures are committed to avoid direct effects upon the LWS calcareous grassland and mosaic habitats.

The converter station will be constructed within an arable field, which is assessed as having low ecological value. Where the application boundary crosses hedgerows and field boundaries the removal of these habitats will be minimised wherever possible and reinstated to at least equal or better value/condition as part of the embedded habitat reinstatement measures. Mature trees, including those with potential to support roosting bats will be entirely avoided wherever possible and protected during the construction phase to avoid impacts upon tree root zones.

**No significant effects** on protected species have been identified by the EcIA. Appropriate precautionary mitigation to ensure legislative compliance will be employed prior to the commencement of site establishment and clearance works including where required pre-construction surveys. Measures to specifically address potential effects of temporary disturbance to habitats and protected species they support are committed to. These include the commitment to pre-construction surveys and mitigation for habitats having potential to /confirmed to support roosting bats, badger, water vole, otter and common species of reptiles. Mitigation for nesting birds and to reduce effects of disturbance to bird at sensitive locations such as at River Hull will also be employed site-wide during the construction phase. Habitats will be fully reinstated post-construction, and therefore there will be **no significant effects** on local populations.

A number of Invasive Non-Native Species (INNS) were recorded within or within proximity to the planning application boundary. Whilst the English Onshore Scheme will not directly impact these species, measures will be put in place to address the legal requirements for INNS, which will be secured through the adoption of an Invasive Non-Native Species Method Statement (INNSMS) committed to within the Construction Environmental Management Plan which will be adopted by the appointed contractor.

## 4.3 Landscape and Visual Amenity

Landscape effects associated with the English Onshore Scheme relate to the changes to the fabric, character, and quality of the landscape and how it is experienced. Visual effects relate closely to changes to the landscape, but primarily concern changes in people's views as a result of the introduction of the English Onshore Scheme. Although effects on the landscape and visual environment are interrelated, they are assessed and reported separately. A study area of 3 km from the converter station and substation, and 1 km from the landfall, underground DC and AC cable routes was agreed with ERYC and SDC.

The landscape of the study area varies from low-lying and undulating coastline and inland agricultural coastal plain of Holderness to the east, the undulating to rolling agricultural landscape of the locally designated Yorkshire Wolds and the large-scale agricultural landscape of the Humberhead Levels to the west. This is a well-settled landscape, including a variety of market towns, smaller villages, hamlets and small clusters of dwellings, and scattered properties. Land use is predominantly agriculture and in particular arable crops. A series of linear features, including road corridors, existing and former railways, and overhead lines cross the study area and further fragment the landscape pattern. No national landscape designations have been identified. Although two registered Parks and Gardens are located within the Yorkshire Wolds which is identified locally by ERYC as an Important Landscape Area (ILA) along with the Lower Derwent Valley to the west of the study area.

The study area includes a range of visual receptors including settlements and residential properties, long distance and local recreational routes, visitor destinations, and transport routes.

Although the construction of the DC and AC cable routes would result in localised noticeable changes to parts of the landscape and views from receptors, these would be temporary nature. There would be **no significant impacts** on the landscape and **no significant impacts** to visual amenity at the majority of receptors owing to considered route selection, avoidance of the loss of landscape features, use of trenchless techniques to minimise visible extent, and the progressive reinstatement of land to its original condition (or better) on completion of the works. Construction impacts for the cable route would be minor in terms of the landscape character area. No long-term effects along the cable route will result due to the full reinstatement of the working areas.

In terms of the converter station, there will be a permanent loss of a small parcel of agricultural land and the localised influence of large-scale construction activity and compounds will appear within the context of Drax Power Station and the dominance of the existing infrastructure locally within the area. This will result in **Minor Adverse** effects in relation to the landscape character area, and **Moderate Adverse** visual impacts for visual receptors in close proximity to the construction site (represented by Viewpoints 10 and 11, PRoWs near Wren Hall and north of Drax Village). All other receptors will experience minor or **Negligible** effects which are not significant. The zone of theoretical visibility of the converter station, i.e. the extent to which the converter station will be visible within the surrounding landscape, is illustrated in **Figure NTS-9**.

Once operational the introduction of the converter station within the immediate context of Drax Power Station complex will slightly increase the presence of industrial development, an already characteristic element of the landscape therefore resulting in **Minor Adverse** landscape impacts. For the receptors in close proximity, **Moderate Adverse** and **significant** effects would remain given the fact that the new converter station will become a prominent new structure within the view. However, as during construction, all other receptors remain at **Minor Adverse** or **Negligible**, which are not considered significant

## 4.4 Archaeology and Cultural Heritage

The English Onshore Scheme passes through differing landscape types, as detailed above, ranging from coastal plains in the east to low-lying wetlands in the west. Archaeological evidence, as well as documentary and cartographic sources, demonstrate that the landscape of the study area has been exploited and settled from the Mesolithic period onwards, although the most prominent remains identified within the planning application boundary date to the Iron Age and Roman period. Extensive remains of field systems, trackways, and settlements have been recorded through aerial photography throughout the study area, and geophysical survey undertaken as part of the scheme has enhanced our understanding of remains within the planning application boundary.

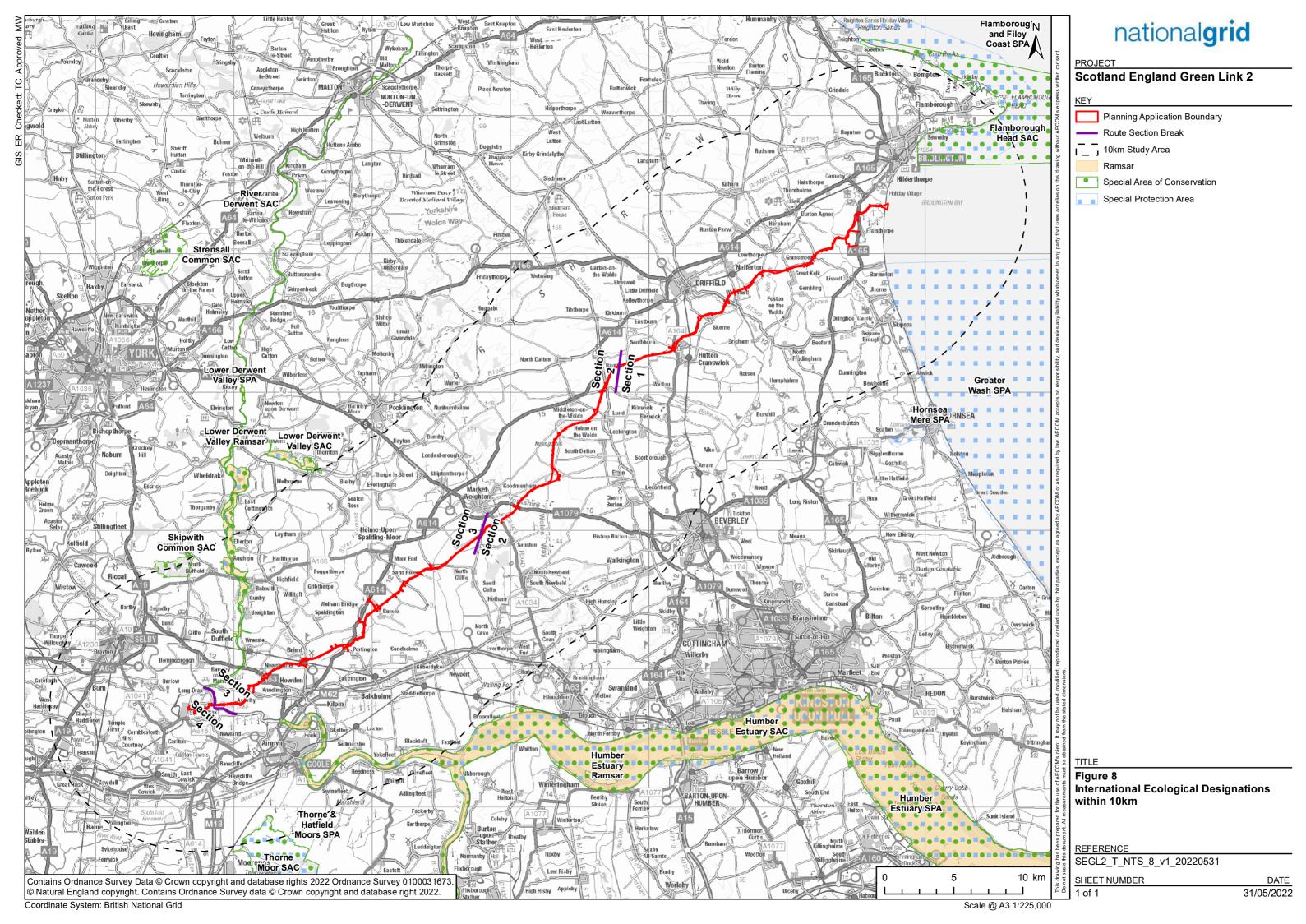
Baseline conditions were assessed through a detailed desk-based assessment using a range of published sources, supplemented by an archaeological geophysical survey (which maps underground features). As agreed with ERYC and NYCC, a study area of 500 m from the English Onshore Scheme boundary was defined for assessing non-designated and designated heritage assets.

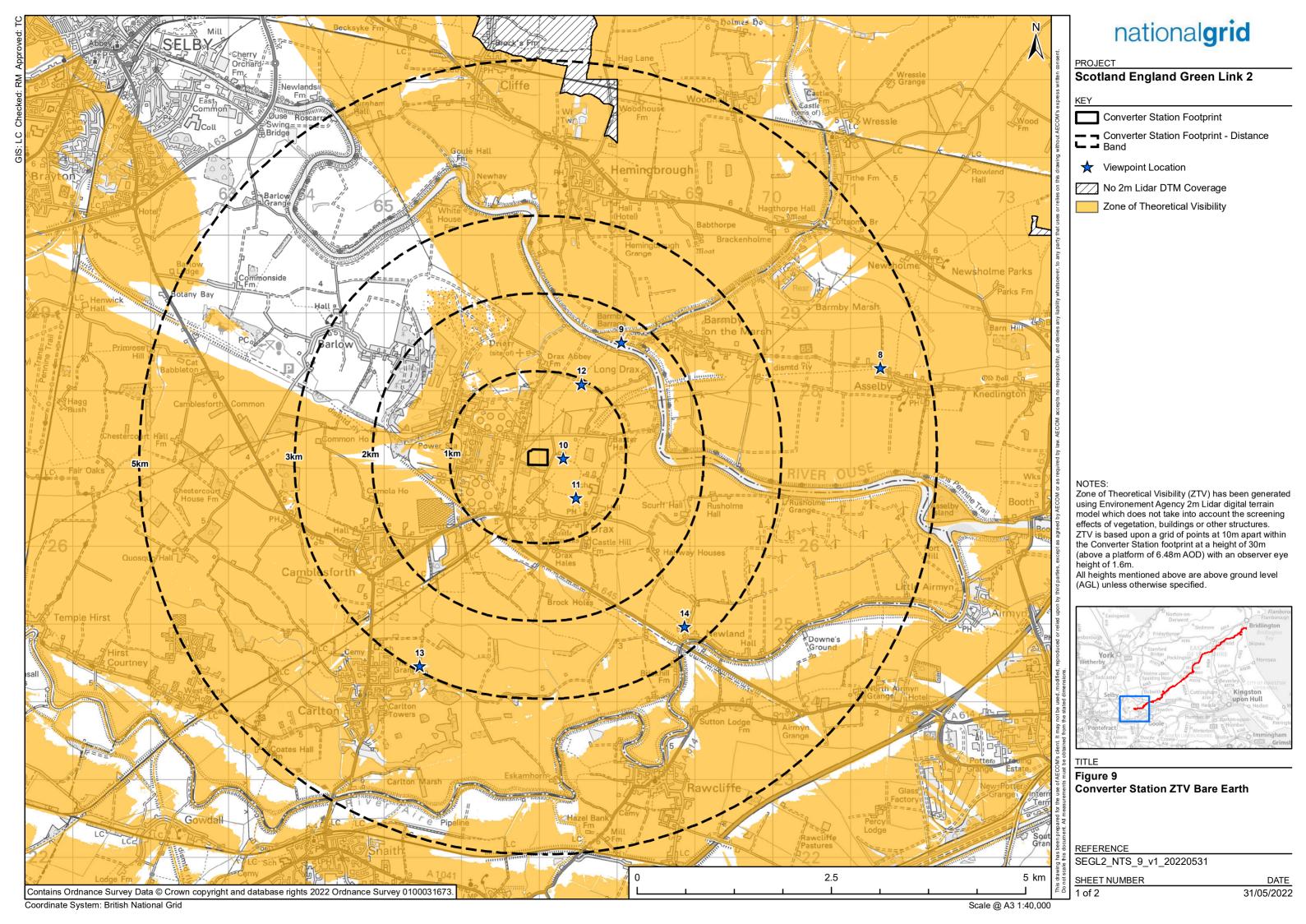
Through iterative assessment potential impacts have been predicted and, where possible, the design of the English Onshore Scheme and/ or how it will be constructed has been developed to prevent or reduce adverse effects to archaeological or heritage assets from the outset.

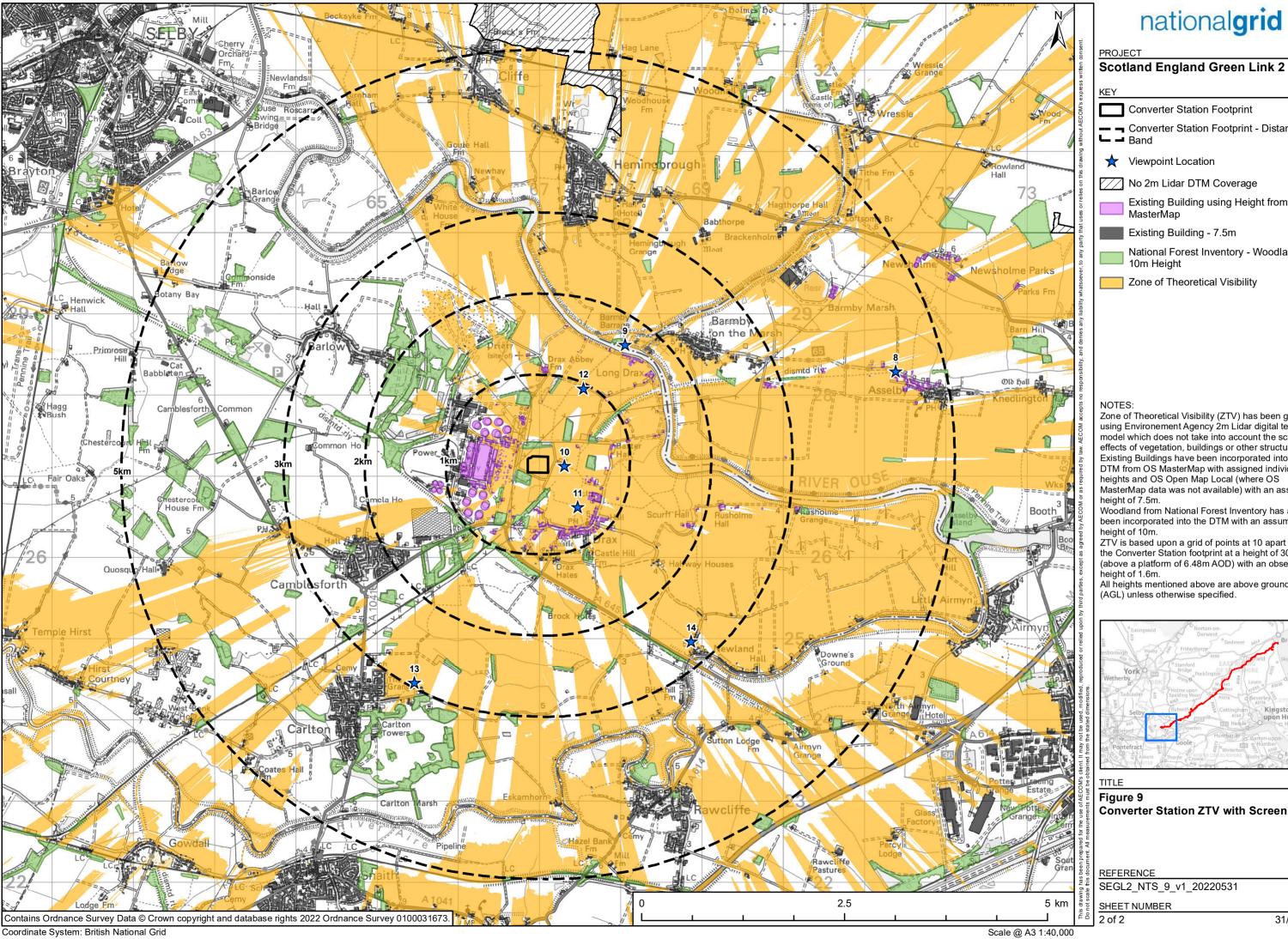
The construction of the underground HVDC cable trench, as well as associated works such as haul routes, construction compounds, and the converter station has the potential to result in permanent effects arising from the loss of buried archaeological features within the planning application boundary. Many of the features have the potential to be of regional interest and medium heritage value and the loss of their archaeological and historical interest would constitute a significant adverse effect. There are 13 archaeological features identified that would be directly impacted with the result of a **Moderate Adverse** (significant) effect. As such, a programme of archaeological mitigation is required. No potentially significant effects on known buried archaeological features are likely within SDC/NYCC. The operational scheme would not result in significant adverse effects to archaeological assets.

The assessment concluded that temporary construction activities would result in significant effects to seven heritage assets, generally in locations where the cable trench and construction compounds are located together within the rural agricultural setting of farms and settlements. These effects would generally remain for the duration of the construction period and would cease once the development is complete and operational. The potential for permanent effects arising from the siting of the converter station and its operation has also been assessed however **no permanent significant effects** were identified.

An Archaeological Mitigation Strategy informed by further archaeological evaluation will be developed. Further geophysical survey (in any areas of the English Onshore Scheme where access was not previously possible) combined with surveys already undertaken will confirm the presence/absence of archaeological remains and follow-up trial trenching will confirm the character, function, date, extent, preservation level and heritage value of any archaeological remains present. The resulting Archaeological Mitigation Strategy will be agreed with ERYC, NYCC and Historic England and may include the excavation, recording and assessment and analysis of archaeological features followed by publication of findings. Further design changes such as the use of trenchless technologies to preserve archaeological features in situ may also be considered.







- Gonverter Station Footprint - Distance

Existing Building using Height from OS

National Forest Inventory - Woodland -

Zone of Theoretical Visibility (ZTV) has been generated using Environement Agency 2m Lidar digital terrain model which does not take into account the screening effects of vegetation, buildings or other structures. Existing Buildings have been incorporated into the DTM from OS MasterMap with assigned individual heights and OS Open Map Local (where OS MasterMap data was not available) with an assumed

Woodland from National Forest Inventory has also been incorporated into the DTM with an assumed

ZTV is based upon a grid of points at 10 apart within the Converter Station footprint at a height of 30m (above a platform of 6.48m AOD) with an observer eye

All heights mentioned above are above ground level (AGL) unless otherwise specified.



**Converter Station ZTV with Screening** 

31/05/2022

## 4.5 Geology and Hydrogeology

The potential effects of the English Onshore Scheme on the geology and hydrogeology within the study area have been assessed. The potential for effects of ground and groundwater contamination materials on human health has also been considered.

The assessment has shown that the geology underlying the English Onshore Scheme comprises variable Glacial Till, alluvium, warp, glaciolacustrine and glaciofluvial deposits. Superficial deposits are shown on published mapping to be absent beneath the majority of Section 2. Bedrock underlying the superficial deposits consists of chalk at the east, Lia Group and Mercia Mudstone in the central part and Sherwood Sandstone at the west. Although not mapped, areas of Made ground are likely to be present associated with developed land, including in the vicinity of Drax Power Station and various current and historical railways.

Five Regionally Important Geological Sites (RIGS) were identified within Sections 1 and 2. Mineral safeguarding areas, in relation to sand and gravel, limestone, clay, chalk and silica sand, were also identified at various locations along the entire length of the route.

In relation to hydrogeology, the superficial deposits are classified as Unproductive Strata to Secondary A Aquifers (corresponding to alluvium and glacial sands and gravels). The chalk and Sherwood Sandstone bedrock strata at either end of the English Onshore Scheme are classified as Principal Aquifers. Groundwater vulnerability is generally classified as medium to high. The route intersects Source Protection Zones (SPZ) 2 (Section 1 and 2) and 3 (all Sections) and passes within approximately 140 m of a SPZ1 at Hutton (Section 1). Six groundwater abstractions, including five for domestic supply, were identified within Sections 1 and 2.

Sites of potentially contaminative current and/or historic land uses have been identified within the study area including quarries and pits, railways and nearby industrial development associated with Drax Power Station. The majority of land within the planning application boundary is used for agriculture.

The identified potential impacts which may occur during the construction phase are primarily associated with spillages and leaks of fuel/oil associated with plant/machinery, disturbance of contaminated soils and potential degradation of soil quality during handling and movement of soil or tracking of heavy plant, as well as the potential for dewatering to locally affect groundwater levels. In addition, there may be the potential for creation of pathways between shallow soils, drilling fluids and/or contaminated groundwater (if present) and deeper (uncontaminated) strata and groundwater, depending on the construction techniques employed. However, all of these effects can be controlled through good practice and standard mitigation measures outlined in the outline Construction Environmental Management Plan (CEMP) (Chapter 18) and the residual effects are considered to be of **Negligible** to **Minor** (**Not significant**).

During the operational phase, identified potential impacts are limited to effects resulting from potential land contamination on site users and groundwater receptors within Section 4 of the route only (at the converter station). Mitigation of the potential impacts will be put in place at construction phase which would also aid in the reduction of operational effects. Required mitigation will be confirmed by means of risk assessments based on ground investigation data (when available) and may include removal of contaminant sources and installation of gas protection measures on the buildings (i.e. the converter station). As such, the significance of residual effects has been assessed as **Negligible** to **Minor (Not Significant)**.

Overall, the mitigation required to address the potential impacts is standard practice. As a result, the overall assessment of effects of the English Onshore Scheme in relation to geology and hydrogeology is predicted to be of **Negligible (Not Significant)** significance with respect to geology, human health and infrastructure, and **Minor (Not Significant)** significance with respect to groundwater.

## 4.6 Hydrology and Land Drainage

The English Onshore Scheme has the potential to impact, or be impacted by, surface water resources, surface water quality, water dependent sites, drainage infrastructure and flood risk.

The main impacts relating to construction were identified as:

increased surface water run off through increases in impermeable areas;

- temporary impacts to local hydromorphology (the physical character and water content of water bodies and how natural and human activity influences them and the ecosystems they support);
- mobilisation of fine sediment to water features effecting water quality through run off or scour;
- displacement of flood water from the introduction of the converter station platform in the floodplain
- mobilisation of oils, cement or other chemicals effecting water quality; and
- severance or disturbance to underground field/land drainage infrastructure which could result in inundation of the working area or changes to the drainage regime outside of the working area.

The main potential impacts relating to operation were identified as:

• increased surface water run off through increases in impermeable areas or compacted areas resulting from the converter station.

Baseline conditions were established through a combination of desk-based study using a range of published data sets and walkover surveys at the landfall and proposed converter station site, areas with high surface water flood risk, land close to urban areas, and surface watercourses within and close to the English Onshore Scheme boundary.

Good industry practice measures have been incorporated into the preliminary scheme design and these will inform the detailed design and/or how the English Onshore Scheme will be constructed. Surface Water Management Plans will be in place to ensure that the quantity and quality of surface water runoff is managed, including a range of good practice pollution prevention measures.

Due to the design mitigation applied at route selection, the English Onshore Scheme avoids standing water bodies, however, a number of surface water bodies are crossed, including, eight main rivers and 10 WFD surface water bodies, as well as ordinary watercourses, WFD designated and IDB maintained channels and minor drains.

A number of designated (SSSI) water dependant biodiversity sites could potentially be impacted by the English Onshore Scheme, but the mitigation measures applied will ensure that impacts are **not significant**.

Parts of Section 1 of the English Onshore Scheme are located within areas of high surface water risk, parts of Section 2 and 3 within areas of medium surface water risk and parts of Section 4 within areas of low surface water risk. Parts of Sections 1, 3 and 4 of the English Onshore Scheme are within areas of Flood Zone 2 and 3, the overall flood risk from groundwater, residual sources, historic risk and sewers to the English Onshore Scheme is low. Therefore, the potential impacts from flood risk are low and impacts are **not significant**.

With the incorporation of appropriate design and construction mitigation measures the effects of the English Onshore Scheme on hydrology and land drainage are **not significant**.

## 4.7 Agriculture and Soils

The study area for soils and agricultural land comprises the planning application boundary, totalling 628.7 ha. Within the proposed working area of the cable route, impacts to soils and agricultural land would be temporary given the short-term nature of the excavation and installation of the cable route (305.2 ha), with permanent development only occurring in the 5.7 ha of the converter station where loss of agricultural land would be permanent.

Soils within the English Onshore Scheme comprise seasonally waterlogged and clayey in texture. The sensitivity of the soil resources within the study area was found to be predominantly low to moderate, with a smaller area of high sensitivity where Newport 1 an Evingham soil associations are present.

Within the study area, the BMV agricultural land comprises 516.5 ha (82.1 % of the study area), of which 1.6 ha (0.3 % of BMV land within the study area) would be permanently lost to the English Onshore Scheme. The effect of this permanent loss of BMV land has been assessed as Not Significant.

Impacts on soils due to disturbance to soil resources and loss of soil resources are possible, but the adoption of embedded mitigation measures (i.e. industry best practice, including pre-commencement survey of remaining agricultural land, and production and implementation of a site-specific Soil Management Plan) would help to prevent/lessen these. With these measure in place, the residual

effects of the English Onshore Scheme to soils and agricultural land are considered to be **Not Significant.** 

#### 4.8 Noise and Vibration Noise and Vibration

The ES has presented an assessment of potential noise and vibration effects during the construction and operational phases of the English Onshore Scheme. Where necessary, means of mitigating the potential significant adverse noise and vibration effects on existing Noise Sensitive Receptors (NSRs) have been provided.

An environmental noise survey was undertaken to establish background noise levels at locations representative of the nearest NSRs based on the location of the English Onshore Scheme. Unattended measurements and short-term attended measurements were undertaken in September 2021. As expected, in rural areas the existing background noise levels are low. The background noise levels are higher at monitoring location LT2 due to noise emitted from Drax Power Station.

Construction noise levels have been estimated based on data in BS 5228-1. At this stage a worst-case assessment has been undertaken based on typical construction activities. Potentially significant effects would be mitigated by adopting best practicable means and enforcement of actions included in the CEMP. As significant effects are short-term and temporary, provision of information containing the timings and duration of construction activities can allow residents within affected areas to accept higher noise levels. As such, noise during the construction phase is assessed as being, at worst, **Moderate Adverse** (significant).

Typical construction working practices are unlikely to generate levels of vibration at local receptors above which cosmetic damage to structures is predicted to occur. Residual effects due to construction vibration is assessed as being, at worst, **Minor Adverse** (**not significant**) at the nearest NSR due to the separation distance between it and the construction works.

All NSRs are predicted to have **Negligible** (**not significant**) residual effects due to construction traffic accessing the site.

Careful design and, where necessary, appropriate attenuation measures, will be employed to ensure that the day to day operational noise from the converter station does not exceed the existing background noise levels at the nearest existing NSR by 5 dB. This is regarded to be eminently achievable based on the options and opportunities available to the Contractor for detailed design. With mitigation measures in place, noise emissions from the operational converter station are assessed as, at worst, **Minor Adverse** (not significant). The potential for low frequency noise from the converter station will be considered during the detailed design stage and if necessary appropriate isolation and attenuation measures will be incorporated into the design.

## 4.9 Traffic and Transport

The during construction the English Onshore Scheme will increase the volume of traffic on the local road network, this includes general traffic (for example private vehicles used by personnel commuting to and from work), light goods vehicles (LGVs), heavy goods vehicles (HGVs) and Abnormal Indivisible Loads (AlLs).

Baseline traffic conditions were established using Automatic Traffic Counts (ATCs) positioned in 34 agreed locations on key roads in the area around the English Onshore Scheme. The anticipated volume of construction-related traffic was calculated by NGET engineers based on their experience of delivering similar schemes, they also represent a reasonable worst-case scenario. The largest increases in predicted traffic flows are experienced at Carr Lane (2025); Burnbutts Lane (2025) and Holme Wold Road (2025 and 2026) during the peak construction activities, which have increases of greater than 30% of existing HGV movements. Whilst the percentage increase in HGVs for Carr Lane, Burnbutts Lane and Holme Wold Road are >30% during peak construction periods, the actual increase in HGV movements per day is minimal (<10). As such with the implementation of appropriate management measures (as implemented through a Construction Traffic Management Plan (CTMP), including considerate timing of deliveries, the increases in HGV movements are not likely to result in a significant impact to receptors on these links.

A CTMP is provided as part of this ES and will be developed further by the appointed Contractor(s) in consultation with the Local Highways Authority (LHA), National Highways (as necessary), and other stakeholders following award of consent enabling management of any construction related traffic and transport impacts. Prior to construction the Contractor(s) will produce a Construction Workers Travel Plan that supports and encourages sustainable travel by workers (public transport, cycling, walking and car-sharing) which will further reduce the traffic impact of the English Onshore Scheme.

Due to the embedding of design mitigation and construction mitigation into the planning application boundary the residual effects of the English Onshore Scheme remain unchanged from the potential effects. The impact of the construction traffic does not exceed the threshold with HGV increases of under 30% in most worst-case assessment scenarios. Notwithstanding this assessment good practice mitigation measures have been outlined to assist in mitigating the majority of temporary traffic impacts associated with the construction phase of the English Onshore Scheme. Construction phase effects will likely be **Negligible** (**Not Significant**).

The operational phase of the English Onshore Scheme requires minimal vehicle trips to the converter station site, which are primarily attributed to the workforce. The number of vehicle movements will therefore be low and would be unlikely to result in significant effects to local residents and road users. It can be concluded that the significance of the operational effects of the English Onshore Scheme would result in a **Negligible** impact, which would **not be significant**.

#### 4.10 Socio-economics, Recreation and Tourism

The population of the 45 minute drive time study area is approximately 3,571,889; in East Riding of Yorkshire is approximately 343,201 and of Selby District is 91,697. Between 2011 and 2020, the population in the study area has grown by 4.8%, in East Riding of Yorkshire has grown by approximately 2.5%, and in Selby District by 9.8%. The economic activity rate of working age individuals in East Riding of Yorkshire is 78.3% and in Selby District is 79.1%. Manufacturing represents the most significant sector in terms of employment in the study area (12.8%), East Riding of Yorkshire (14.8%) and Selby District (22.9%). In both local authorities, there are relatively low levels of deprivation recorded, compared with the wider geography of Yorkshire and the Humber.

The location of the route of the English Onshore Scheme is largely rural in nature and there are no significant receptors, besides PRoWs and the Kiplingcotes Derby, of relevance to the socio-economics, recreation and tourism assessment identified within the planning application boundary.

The socio-economics, recreation and tourism assessment considers receptors that lie within the study area, which is variable depending on the receptor being assessed. The findings of the assessment of impacts on socio-economics, recreation and tourism receptors during the construction phase are presented below:

- The English Onshore Scheme will generate employment during the construction phase. It is
  estimated that the peak workforce will be 865 construction workers during months seven, eight,
  and nine. The average workforce, after taking into account leakage, displacement, and multiplier
  effects, is calculated to be 426. Therefore, the effect on the local economy from construction
  generated as a result of the English Onshore Scheme is assessed to be temporary minor
  beneficial, which is considered not significant;
- The construction phase will result in GVA generation in the local economy. It is calculated that approximately £18.4m within the 45 minute study area and £5.5m elsewhere will be generated, resulting in a total of £23.9m. Therefore, the effect on the local economy from GVA generated as a result of the English Onshore Scheme is assessed to be temporary minor beneficial, which is considered not significant. The English Onshore Scheme traverses a number of existing public rights of way. It is anticipated that no closures of PRoWs will be required as a result of construction activities. It is anticipated that the vast majority of PRoWs will experience no impact and where temporary diversions are necessary, these will be short and localised in nature. It is therefore assessed that the effect on users of PRoWs is temporary minor adverse, which is considered not significant;
- As no significant effects on users of PRoWs is identified, it is not anticipated that there will be any
  impact on community severance as a result of the English Onshore Scheme. Therefore, the

effects on community severance arising from the English Onshore Scheme is assessed to be negligible, which is considered not significant;

- As any disruption to residential properties, business premises, community facilities, visitor
  attractions, and open space is minimised through the implementation of temporary road
  diversions meaning access is not temporarily or permanently lost, and that no major visitor
  attractions and open spaces fall within the study area due to good design, the effect on these
  receptors as a result of the English Onshore Scheme is assessed to be negligible, which is
  considered not significant;
- The Kiplingcotes Derby circuit route traverses the planning application boundary. The Derby will
  not be cancelled as a result of the English Onshore Scheme as the timing of works, including any
  reinstatement will be planned to avoid the event, and prevent any impact to the Derby. Therefore,
  the effect on the Kiplingcotes Derby is assessed to be negligible, which is considered not
  significant;
- Taking into account the results of the noise and vibration, transport and access, and landscape
  and visual amenity assessments, there are no groups of residential properties, businesses, or
  other users of private assets that would likely experience two or more significant effects, as
  concluded by these assessments, at the same time which would result in effects on their amenity
  during construction. The effect on the amenity of private assets is therefore assessed to be
  negligible, which is not significant.
- There are no development land allocations identified within the study area and therefore it is
  assessed that the English Onshore Scheme will not impact on the viability of any development
  land allocations. Therefore, the effect on development land as a result of the English Onshore
  Scheme is assessed to be negligible, which is considered not significant.
- The design of the English Onshore Scheme has taken account of publicly available information as well as that provided by landowners with regard to other future developments. As a result it is considered that the English Onshore Scheme will have no impact (or negligible impact) on other development proposals.

The findings of the assessment of impacts on socio-economics, recreation and tourism receptors during the operation phase are presented below:

The English Onshore Scheme will generate employment at the converter station during operation.
The operation of the English Onshore Scheme will result in six FTE jobs. Therefore, the effect on
the local economy as a result of employment during operation is assessed to be negligible, which
is considered not significant.

This assessment has concluded that there will be no potential significant adverse socio-economics, recreation and tourism effects during the construction or operation phases of the English Onshore Scheme and therefore no additional mitigation measures are required.

There are no residual significant effects of the English Onshore Scheme on socio-economics, recreation and tourism, as no significant effects have been identified.

#### 4.11 Waste and Materials

The baseline study for material resources indicated that there is sufficient supply of primary raw materials such as steel, aggregates, and cementitious products available for the English Onshore Scheme. The English Onshore Scheme lies within the Yorkshire and the Humber region, approximately 60 km south of the southern border of the North East region. The scale and location of permitted reserves, together with the associated site production capacities, across the region indicates that there are sufficient reserves to ensure the future provisions of sand and gravel and crushed rock supply at levels above the minimum requirements.

The baseline study for generation and management of waste indicates that there are sufficient waste infrastructure in North Yorkshire region to accommodate waste from the region. There are 19 historical landfill sites along the route of the English Onshore Scheme. The baseline study for remaining landfill capacity indicates that the North Yorkshire region has capacity to accommodate inert and non-hazardous waste.

The receptors for the use of material resources are raw minerals and quarries site and the adverse impacts on these receptors include:

- Impacts on the availability of material resources, and subsequent impacts on the demand for key
  construction materials as materials will need to be imported on-site as the English Onshore Scheme
  is unlikely to recover/re-use all the site won material and site-won materials may not be adequate
  for the construction; and
- Depletion of non-renewable resources as majority of materials needed on the project comprise primary material as the English Onshore Scheme is unlikely to be able to source all requirement materials from recycled/secondary materials.

It is assumed that the construction works of the English Onshore Scheme will re-use the majority of the site won material. It has also been assumed that the aggregates and stones supply will consist of recycled and secondary aggregates, in line with regional adopted Plan target, where technically appropriate and economically feasible. The effect of the magnitude impact from the construction of the underground DC cable route and the converter station on the raw minerals raw minerals and quarries site will be **Not Significant**.

The receptors for the generation and management of waste are the waste infrastructure and landfill sites. The adverse impacts on these receptors include:

• Production of waste (inert/hazardous/non-hazardous) resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.

The English Onshore Scheme is not expected to generate inert waste. Hazardous waste, if generated, will not be of significant quantity and would be landfilled within the same regional landfills of Humber and Yorkshire region. The English Onshore Scheme will generate some non-hazardous waste, however if landfilled this will occupy less than 1% of the non-hazardous landfill capacity of the North Yorkshire region. Hence, the impacts on the generation and management of waste will be **Minor adverse** and **Not Significant**.

The following mitigation plans will be implemented for material resource use and generation and management of waste:

- The waste hierarchy will be implemented throughout the construction to minimise disposal and maximise re-use and recycling of waste arisings;
- An outline SWMP will be produced by the contractor to support the English Onshore Scheme application; and
- An outline SMP will be produced by the contractor, which will set out how excavated soils are to be managed.

The residual significant effects after implementation of the relevant mitigation, for use of material resources and generation and management of waste will remain the same as stated in the assessment and is given below:

- Material resource use: Minor Adverse and Not Significant; and
- Generation and management of waste: Minor Adverse and Not Significant.

## 5. Cumulative Assessment

A cumulative assessment has been undertaken of both intra-project and inter-project effects. Intra-project effects have considered the impact of multiple environmental topics on the same receptor (i.e. the potential for a combined impact of increased disturbance (such as noise) and reduced visual amenity on walkers and visitors. Inter-project effects have considered the potential cumulative impacts from the simultaneous development of the English Onshore Scheme with other projects or activities that are both reasonably foreseeable in terms of delivery and are geographically located in a position where environmental impacts could act together to create an effect on a receptor that is more (or less) significant overall than the effect of individual developments alone. A systematic review of projects either already within or known to soon enter the planning system were reviewed by each of the specialists to determine potential cumulative impacts.

Whilst there is the potential for combined effects at some receptors during the construction and operational phases, it is considered that the significance of combined effects would be no greater than the significance of any individual effect; the mitigation measures and commitments identified in the Outline CEMP and the embedded mitigation measures built into the English Onshore Scheme design remain appropriate and no further measures are proposed because of the combined effects assessment. While cumulative effects are not identified as significant, NGET are committed to working with other developers in the region to coordinate construction activities and reduce potential cumulative effects of construction related disturbance as far as reasonably possible.

The impact assessment has concluded that construction of the English Onshore Scheme in combination with the Marine Scheme, will not result in any intra-project cumulative effects.

# 6. Summary and Conclusions

## 6.1 Summary

This ES has identified and assessed the likely significant effects which would result from the construction and operation of the English Onshore Scheme. Through careful siting and routeing as well as embedding mitigation within the design, NGET has prevented or reduced the majority of potentially significant environmental effects. However, given the scale and nature of the English Onshore Scheme some significant environmental effects are unavoidable and as such a small number will remain following mitigation.

Additional, or project-specific, mitigation measures have also been identified and committed to be implemented during construction as set out in the outline CEMP to further avoid or reduce potential impacts. NGET is committed to working with their appointed Contractor(s) to reduce the environmental effects of the English Onshore Scheme as far as practicable in finalising the detailed scheme design and undertaking construction works. This approach will ensure the actual effects of the English Onshore Scheme would be no greater than the likely effects identified and assessed in the ES.

For the majority of receptors identified within the specialist assessments, potential effects are not likely to be significant. The majority of effects are associated with the installation of the underground cable due to the length of the route, however these effects will be temporary during the installation phase only and given the nature of the installation these periods will likely be short in duration. There will be no effects during the operation of the underground cable.

The potentially significant effects that are predicted to remain after the implementation of mitigation are listed below.

## 6.2 Landscape and visual amenity

The landscape and visual assessment concluded that there would be no significant effects on the landscape character or the locally designated landscapes during construction or operation of the English Onshore Scheme. For the majority of visual receptors including those within 1 km of the converter station no significant effects will result during construction or operation.

Significant residual effects (Moderate adverse) will occur as a result of the construction of the converter station and remain during operation for visual receptors in close proximity to the converter station where its height and mass will appear as a prominent feature within their views. The scale of the converter station is such that planting will not screen views and additional mitigation will not be effective in further reducing effects. Project specific mitigation measures, such as minimising the height of structures, careful selection of material and colours and sensitive lighting design will however be further considered as part of the detailed design stage.

## 6.3 Archaeology and cultural heritage

Through the archaeological and cultural heritage assessment, many of the features identified have been identified to have the potential to be of regional interest and medium heritage value and the loss of their archaeological and historical interest would constitute a significant adverse effect. As such, a

programme of archaeological mitigation is required. A total of 20 assets that may be significantly affected as a result of the English Onshore Scheme.

- 13 features/assets may be directly (physically) impacted during construction resulting in the loss of archaeological deposits/features.
- Seven features/assets may be impacted temporarily through the change of setting as a result of the presence of construction areas and works activities.

All of these impacts are predicted to be Moderate adverse (significant), with the exception of the temporary impact to the setting of the Church of St Mary and the Virgin located within Wansford which is predicted to result in a **Major Adverse** (**significant**) effect. All of the above potentially significant effects are to archaeological or cultural heritage assets located within ERYC.

#### 6.4 Noise and vibration

Moderate noise effects will occur during construction of the English Onshore Scheme at three noise sensitive receptors (residential properties), however these will be temporary and short-term. One of these locations is within ERYC, and the other two are within SDC. All of these potentially significant effects are predicted to be **Moderate Adverse** (significant) and would be associated with the construction of access roads and/or establishment of construction compounds at properties that are within close proximity to the proposed works. These enabling works typically require the use of excavators, dump trucks and deliveries of aggregate. Due to the nature of the works associated with these exceedances, the period in which these noisy activities will persist is consequently short-term and temporary with works typically taking up to two weeks to complete.

These effects are subject to the selection of machinery adopted to complete the works. Further detailed assessment will be undertaken before construction (when precise construction details are known), this will allow appropriate location-specific mitigation measures to further reduce impacts to be identified (such as timing restrictions or the use of acoustic panels/ fencing), and for the residents to be made aware of the works and engaged on their timing and nature to best forewarn them of the activities taking place, and if agreeable for works to avoid sensitive periods.

# 7. Next Steps

The results of the environmental assessment will be considered as part of the decision-making process of whether to grant permission for the components of the English Onshore Scheme that are included in the planning application(s). As described within this NTS, one of the key aims of the ES is to ensure that the potential environmental effects of the English Onshore Scheme are known and understood so that these may be considered before deciding whether or not to approve the development of the English Onshore Scheme.

In considering the planning application(s), ERYC and SDC will consult with a range of organisations such as Natural England, the Environment Agency, and Historic England, as well as inviting comments from the local community. The responses to the planning application from all parties, including comments made in relation to results of the ES, will be considered in determining the planning application.

Should planning permission be granted, a Contractor(s) will be appointed and the detailed design of elements of the English Onshore Scheme will be progressed and, where appropriate, agreed with ERYC and SDC prior to works commencing.

## 8. References

**Ref NTS-1**. The Planning Inspectorate. National Infrastructure Planning Advice Note Nine: Rochdale Envelope. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/#2

**Ref NTS-2** Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Available at <a href="https://www.legislation.gov.uk/uksi/2017/571/introduction/made">https://www.legislation.gov.uk/uksi/2017/571/introduction/made</a>

**Ref NTS-3** Guidelines for Environmental Impact Assessment (IEMA) 2004. Available at <a href="https://www.iema.net/download-document/7014">https://www.iema.net/download-document/7014</a>

**Ref NTS-4** British Standards Institute (2009 with 2014 amendments) BS 5228:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Noise, BSi, London.

