

Yorkshire GREEN Project

Preliminary Environmental Information Report

Volume One Non Technical Summary

October 2021

nationalgrid

Contents

1.	Introduction	5
1.1	Overview	5
1.2	Purpose of this Non-Technical Summary	5
1.3	Yorkshire GREEN	6
1.4	Who is National Grid?	7
1.5	Why is Yorkshire GREEN needed?	7
1.6	The consenting process	8
2.	Overhead line route selection and alternatives	10
2.1	Introduction	10
2.2	Strategic proposal: Identifying potential connection points	11
2.3	Identifying potential route corridors and substation locations	14
2.4	Refining the Yorkshire GREEN design	20
3.	What is being proposed?	22
3.1	Key Components of Yorkshire GREEN	22
3.2	Construction works	28
3.3	What is the timeline for construction and operation of Yorkshire GREEN?	30
4.	Preliminary environmental impact assessment	33
4.2	What is the Preliminary Environmental Information Report?	33
4.3	Scoping and engagement	34
4.4	Assessment methodology	35
4.5	Embedded environmental measures	36
4.6	Topics scoped out of the PEIR	36
4.7	Reporting EIA assessment results	36
5.	Preliminary Environmental Assessment	38
5.1	Introduction	38
5.2	Landscape and visual	38
5.3	Historic environment	42
5.4	Biodiversity	45
5.5	Hydrology	47

5.6	Geology and hydrogeology	50
5.7	Agriculture and soils	53
5.8	Transport	56
5.9	Air quality	58
5.10	Noise and vibration	59
5.11	Health and Wellbeing	62
5.12	Socio-economics	64
6.	Looking forward	66
6.2	What happens next?	66
6.3	What if I would like further information?	66
6.4	How can I have my say?	67

Table 1.1 – What’s included	5
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Graphic 1.1 - Consenting Process for Yorkshire GREEN	9
Graphic 2-1 - Design Evolution Process	10
Figure 2.1 – Strategic connection options (2019)	12
Figure 2.2 - 2019 Strategic Proposal (2020)	13
Figure 2.3 Potential route corridors	14
Figure 2.4 - Preferred corridor: Option 1	16
Figure 2.5 - Preferred corridor: Option 2	17
Figure 2.6 - Preferred locations for CSECs at Tadcaster	18
Figure 2.7 - Preferred location for Monk Fryston substation	19
Graphic 3.1 - Typical gantry	22
Graphic 3.2 – Image of typical substation (existing Monk Fryston Substation)	23
Graphic 3.3 – Typical substation layout	24
Graphic 3.4 – Pylon component	27
Graphic 3.5 – Indicative construction programme	31
Graphic 4.1 - The EIA process	34

Non-Technical Summary

1. Introduction

1.1 Overview

- 1.1.1 This Non-Technical Summary (NTS) presents a summary of the information and preliminary environmental impact assessment (EIA) undertaken to date, as set out in the more detailed Preliminary Environmental Information Report (PEIR) for the Yorkshire Green Energy Enablement (GREEN) project (referred to as Yorkshire GREEN).
- 1.1.2 Yorkshire GREEN is a project proposed by National Grid Electricity Transmission (referred to as National Grid) to upgrade and reinforce the high-voltage power network, so that more clean energy reaches homes and businesses in Yorkshire and further afield. It comprises new electricity infrastructure, such as new overhead lines, substations, cables and equipment to connect overhead lines to buried cables, known as Cable Sealing End Compounds (CSECs), as well as works to existing overhead lines and substations.

1.2 Purpose of this Non-Technical Summary

- 1.2.1 The aim of the NTS is to enable the local communities and other stakeholders to understand the likely preliminary environmental effects arising from Yorkshire GREEN in a concise manner which is easily understood and accessible by all. Effects are assessed in terms of how ‘significant’ they would be, and EIA is primarily concerned with ‘likely significant effects’ and not those unlikely to be significant.
- 1.2.2 This NTS includes a description of Yorkshire GREEN, a summary of the consultation process and the EIA work undertaken to date. **Table 1.1** sets out a summary of each of the sections of this NTS.

Table 1.1 – What’s included

Chapter	What is it about?
1: Introduction	This Introduction chapter introduces what Yorkshire GREEN is, where it is located and why it is needed. An introduction is also given to National Grid.
2. Overhead line route selection and alternatives	This chapter explains the alternative designs considered to date and provides a summary of how the design has evolved and developed to date.
3: What is being proposed?	This chapter explains how Yorkshire GREEN would be built (should it be consented), what new electricity infrastructure would be implemented and how long construction would take.
4: Preliminary environmental impact assessment	This chapter explains how the preliminary assessment has been undertaken and how it has been informed by consultation and stakeholder engagement to date.

Chapter	What is it about?
5: Preliminary environmental assessment	This chapter provides a summary of the approach to environmental assessment and the potential environmental effects arising from Yorkshire GREEN which have been identified to date. For each of the environmental topics, the chapter provides an overview of how the environmental effects have been assessed, a description of the existing environment, overview of environmental measures to avoid or reduce where possible, the potential environmental effects arising from Yorkshire GREEN and next steps for the assessment.
6: Looking forward	This chapter explains what happens next in the EIA process, and how you can have your say on the proposals.

1.3 Yorkshire GREEN

- 1.3.1 National Grid is proposing to upgrade and reinforce the electricity system in Yorkshire to satisfy increases in power flows and energy demand. Yorkshire GREEN is necessary to support growth in green energy for Scotland and the north-east of England and to assist the delivery of the Government's commitment to quadruple the UK's offshore wind capacity by 2030¹.
- 1.3.2 Yorkshire GREEN comprises new electricity infrastructure, located within six local authority boundaries. Broadly, the components of infrastructure fall within three distinct areas, as follows (see **Figure 1**):
- North West of York: New infrastructure including three new sections of overhead line of high voltage (400 kilovolts (kV) and 275kV).
 - A new substation, new cable and two CSECs and associated buried cables (a CSEC allows two overhead lines to connect to each other).
 - Replacement of some sections of existing overhead lines, as well as the dismantling and removal of other sections. Those sections to be removed fall between Haxby and Skelton to the east, Moor Monkton to the west and Shipton by Beningborough to the north-west.
 - Tadcaster: There would be two new CSECs and cables installed at a location approximately 2.8km south-west of Tadcaster and between the A64 and A659.
 - Monk Fryston: A new substation, built next to the existing electricity substation located east of Rawfield Lane. Some of the existing overhead lines which connect to the existing substation would be realigned to connect to the new substation. This area is located south of the A63 and north of the A1(M) and approximately 2.3km south-west of the village of Monk Fryston.
- 1.3.3 Works would be undertaken to an existing overhead line which runs from the existing substation at Monk Fryston to Poppleton substation to the north-west of York. In addition, some works would be undertaken within operational land at the existing

¹ Prime Minister's Office, 10 Downing Street, Department for Business, Energy & Industrial Strategy, The Rt Hon Boris Johnson MP, and The Rt Hon Alok Sharma MP (2020). New plans to make UK world leader in green energy (Online) Available at: <https://www.gov.uk/government/news/new-plans-to-make-uk-world-leader-in-green-energy> (Accessed October 2021).

substation at Osbaldwick 3.7km east of York city centre and 700m west of the A64/A1079 roundabout.

Draft Order Limits

- 1.3.4 The draft Order Limits form the boundary of the entire area within which Yorkshire GREEN could take place, including temporary and permanent works as well as the works to the existing infrastructure. They represent the current anticipated maximum extent of land within which Yorkshire GREEN may take place.
- 1.3.5 Within the draft Order Limits, parameters known as Limits of Deviation (LoD) are set out. These incorporate a proportionate degree of flexibility into the design so that unforeseen issues, that are encountered following consent can be dealt with. For example, previously unidentified poor ground conditions may require a pylon to be moved slightly for geotechnical reasons, such as ground stability. These limits will set specific parameters to moving infrastructure on the ground as well as control changes to the vertical height of the infrastructure.

1.4 Who is National Grid?

- 1.4.1 National Grid owns the high voltage electricity transmission system in England and Wales and operates the high voltage electricity network throughout Great Britain, transporting electricity from generators (such as power stations and wind farms) to local distribution network operators (DNOs). DNOs, such as Northern Powergrid, are the companies that own and operate the local power lines and infrastructure that delivers electricity to individual properties. National Grid's network does not connect directly to homes and businesses, because the voltage at which it transmits electricity is too high for domestic and commercial properties.

1.5 Why is Yorkshire GREEN needed?

- 1.5.1 Currently Great Britain is home to the largest operating offshore wind capacity in the world. The updated Offshore Wind Sector Deal² seeks to increase energy delivery by up to 40 gigawatts (GW) (equivalent to 40 billion watts) by 2030. This increase in renewable energy generation, in line with the Government's 'Net Zero' targets to balance the amount of greenhouse gas produced and the amount removed from the atmosphere, is driving a need to expand the capacity of National Grid's transmission system.
- 1.5.2 Electricity flows are set to double within the next ten years as a result of offshore wind developments, other sources of clean energy and expanding interconnection capacity (high-voltage cables that connect the electricity systems of neighbouring countries) in both Scotland and north-east England. Yorkshire GREEN would contribute towards strengthening the National electricity transmission network so that it can accommodate this growth in electricity flows. Reinforcement would ensure that the network is not overwhelmed, and that potential future pressures on the network are relieved in the north and north-east of England, whilst balancing supply and demand.
- 1.5.3 Without additional reinforcement, the existing transmission system would become overloaded. To stop these overloads from happening, National Grid Electricity System

² HM Government (2019). Industrial Strategy Offshore Wind Sector Deal (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790950/BEIS_Offshore_Wind_Single_Pages_web_optimised.pdf (Accessed October 2021).

Operator would need to constrain power generation. This would involve paying generators to not produce power in one area to reduce congestion around a particular point of the transmission network. Such action could result in significant costs to consumers.

- 1.5.4 As a result, it is necessary and economical to invest in network reinforcement in the long term, and critically to ensure that Yorkshire GREEN is operational by 2027. Reinforcement of the network would enable an increase in the transfer of clean energy, increasing network capacity and avoiding constraint costs³ which are likely to occur at the end of 2027 from planned projects connecting to the network at that time.
- 1.5.5 Other projects which are reliant on Yorkshire GREEN being implemented include:
- Scotland England Green Link (SEGL1) - 2GW offshore link from Torness in East Lothian to Hawthorn Pit in County Durham;
 - Continental Link Multi-Purpose Interconnector - 1.8GW interconnector (with Norway);
 - Atlantic Superconnection - 1GW interconnector (with Iceland) at Creyke Beck near Hull; and
 - Hornsea P4 – 2.6GW offshore wind farm at Creyke Beck near Hull.

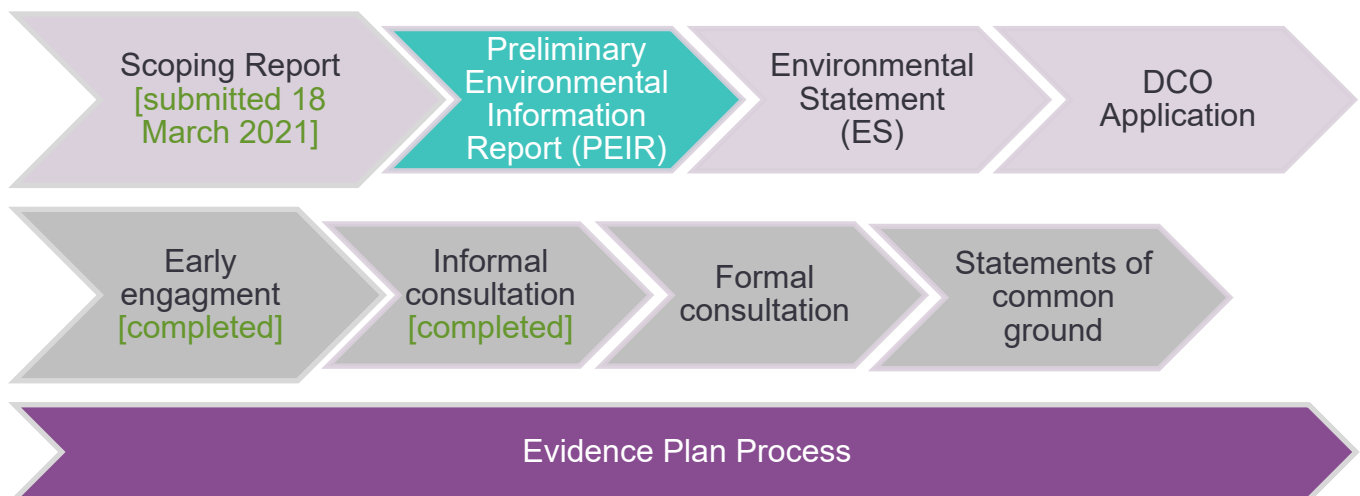
1.6 The consenting process

- 1.6.1 Yorkshire GREEN is a Nationally Significant Infrastructure Project (NSIP). The Planning Act 2008 and associated regulations form the basis for NSIP applications and the policy content for their consideration and determination is set out in the relevant National Policy Statements (NPSs). The following NPSs are of direct relevance to Yorkshire GREEN:
- EN-1 Overarching Energy; and
 - EN-5 Electricity Networks.
- 1.6.2 These NPSs are currently under review and being consulted on by the UK Government.
- 1.6.3 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and how these should be applied. The NPPF helps inform decision-making on planning applications and includes policies and principles regarding the protection and conservation of the natural and built environment as well as sustainable growth and development which might affect Yorkshire GREEN.
- 1.6.4 Yorkshire GREEN lies within the administrative boundaries of Hambleton District Council, City of York Council, Harrogate Borough Council, Selby District Council, Leeds City Council and North Yorkshire County Council. Relevant local development plans have been reviewed so that any planning policy conflicts can be identified and avoided wherever possible.
- 1.6.5 EIA is the process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances.

³ These are costs that would occur because the NGENSO (National Grid Electricity System Operator) would need to constrain power generation by paying a generator not to produce power in one area to reduce congestion around a particular point of the transmission network.

- 1.6.6 A range of environmental legislation at International, European and National level will apply to the EIA for Yorkshire GREEN. The EIA will be undertaken in line with the identified legislation and policies, specifically in accordance with the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, hereafter referred to as the 'The EIA Regulations 2017'. In addition, to promote the application of EIA and aid the interpretation of these regulatory requirements, government and other institutions have published a series of guidance documents. For NSIPs advice notes have been published by the Planning Inspectorate. These advice notes are non-statutory, however, they provide guidance and information on a range of issues arising throughout the whole EIA process.
- 1.6.7 As Yorkshire GREEN includes a new overhead electricity transmission connection of more than 2km in length, with an operating voltage above 132kV it is defined as a Nationally Significant Infrastructure Project (NSIP) under Section 14 of the Planning Act 2008 (as amended). An application for development consent for Yorkshire GREEN will therefore require submission to the Planning Inspectorate, who will consider the application and make a recommendation to the Secretary of State for Business, Energy and Industrial Strategy (BEIS), who will decide whether development consent should be granted. This consenting process is shown in **Graphic 1.1**.

Graphic 1.1 - Consenting Process for Yorkshire GREEN



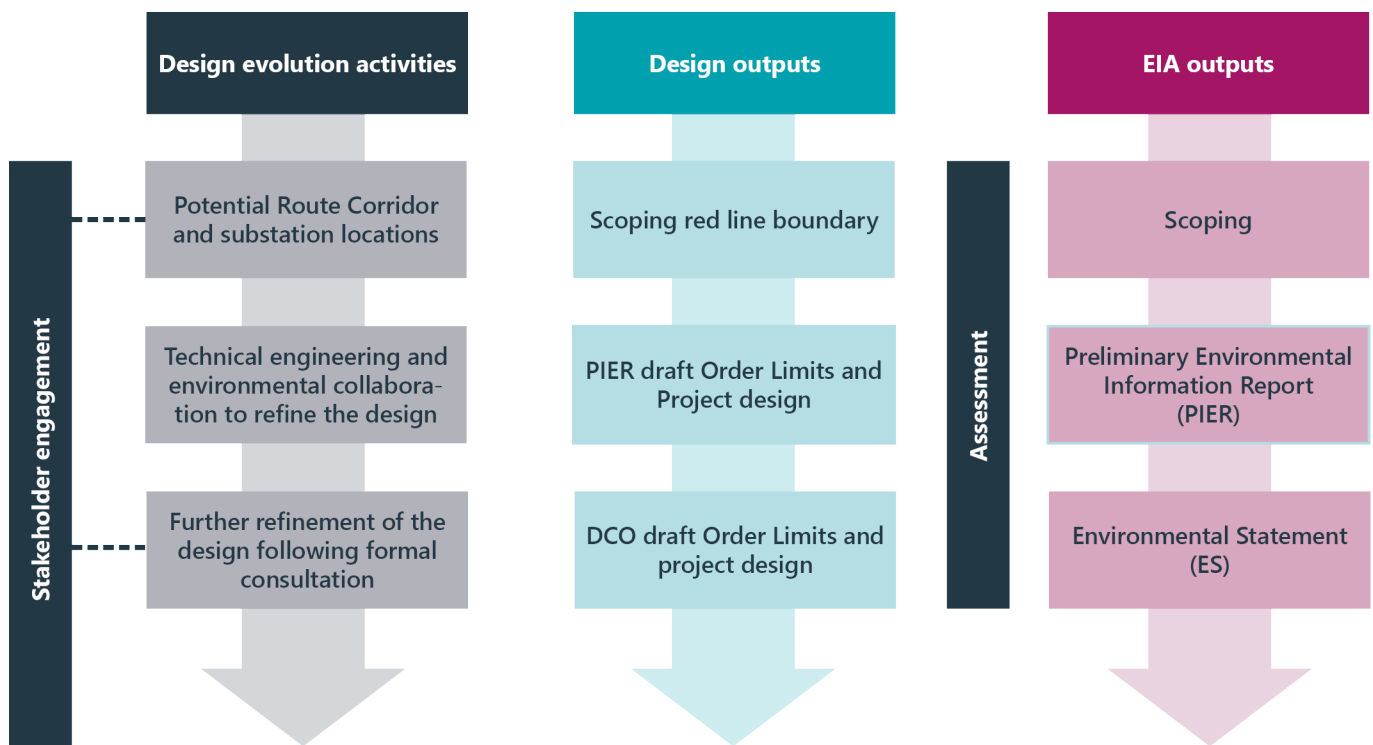
- 1.6.8 The Development Consent Order (DCO) application will be accompanied by an Environmental Statement (ES) in accordance with the EIA Regulations 2017.
- 1.6.9 The requirement to consult on preliminary environmental information is set out in the EIA Regulations 2017 and associated Advice Notes published by the Planning Inspectorate. The PEIR has been prepared to enable consultation bodies (for example Natural England and the Environment Agency), members of the public and other stakeholders, to develop an informed view of the likely significant effects of Yorkshire GREEN and comment on particular aspects of interest prior to the submission of the DCO application.

2. Overhead line route selection and alternatives

2.1 Introduction

- 2.1.1 The selection of points to connect to the existing electricity network, the overhead route alignment and locations for new infrastructure such as substations form part of the design evolution process, which is a fundamental part of the EIA. The design evolution process has been guided by detailed specialist engineering considerations, environmental assessment and engagement with local stakeholders, regulatory stakeholders and non-governmental organisations.
- 2.1.2 This iterative and informed design process has allowed National Grid to identify, develop and adopt mitigation measures that will reduce the potential for environmental effects. These have been incorporated into the design of Yorkshire GREEN and are referred to as ‘embedded environmental measures’. A range of embedded environmental measures have been identified at this PEIR stage and are further discussed in **Section 4.55**. Examples include using best practice environmental measures to avoid sensitive receptors (i.e. timing the removal of vegetation to avoid the bird breeding season where practicable). **Graphic 2-1** provides a summary of the design evolution process.

Graphic 2-1 - Design Evolution Process



806503 Evolution and outputs graphic.indd

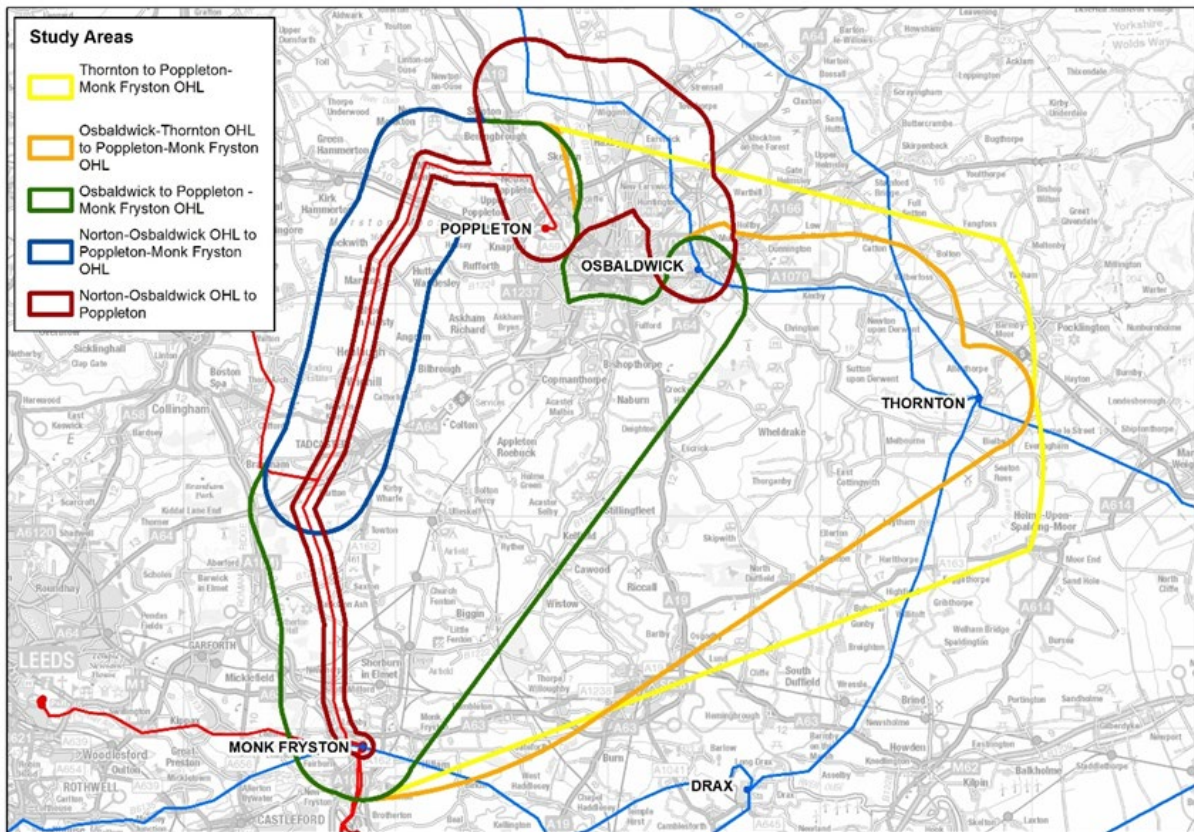
2.2 Strategic proposal: Identifying potential connection points

2.2.1 In 2019, over 300 options were initially identified to meet the need outlined by National Grid to reinforce the electricity transmission network in this area. These options comprised overhead lines and underground cable connections which could connect various potential 'start' and 'end' points throughout Yorkshire. A short list of options was produced to meet the following requirements, including:

- Options which allowed the re-use of existing infrastructure because building completely new infrastructure could increase environmental effects and cost.
- Options which ensured that National Grid could meet its legal requirements to preserve amenity and implement measures to mitigate effects on such features, including:
 - preserving natural beauty;
 - conserving flora and fauna as well as geological and physical features of special interest; and
 - protecting sites, buildings or objects with architectural, historic or archaeological interest.
- Options with shorter connection routes (where feasible) to minimise potential environmental impacts and costs.

2.2.2 Five main strategic options were identified (see **Figure 2.1**). These connected a combination of different 'start' points (an existing overhead line between Norton and Osbaldwick overhead line, Thornton substation or an existing overhead line between Osbaldwick and Thornton) and 'end points' (either Poppleton Substation or the existing overhead line between Poppleton and Monk Fryston). These options comprised a combination of new infrastructure and upgrades to existing infrastructure. All options however would result in the need to do work to an existing overhead line between Poppleton and Monk Fryston.

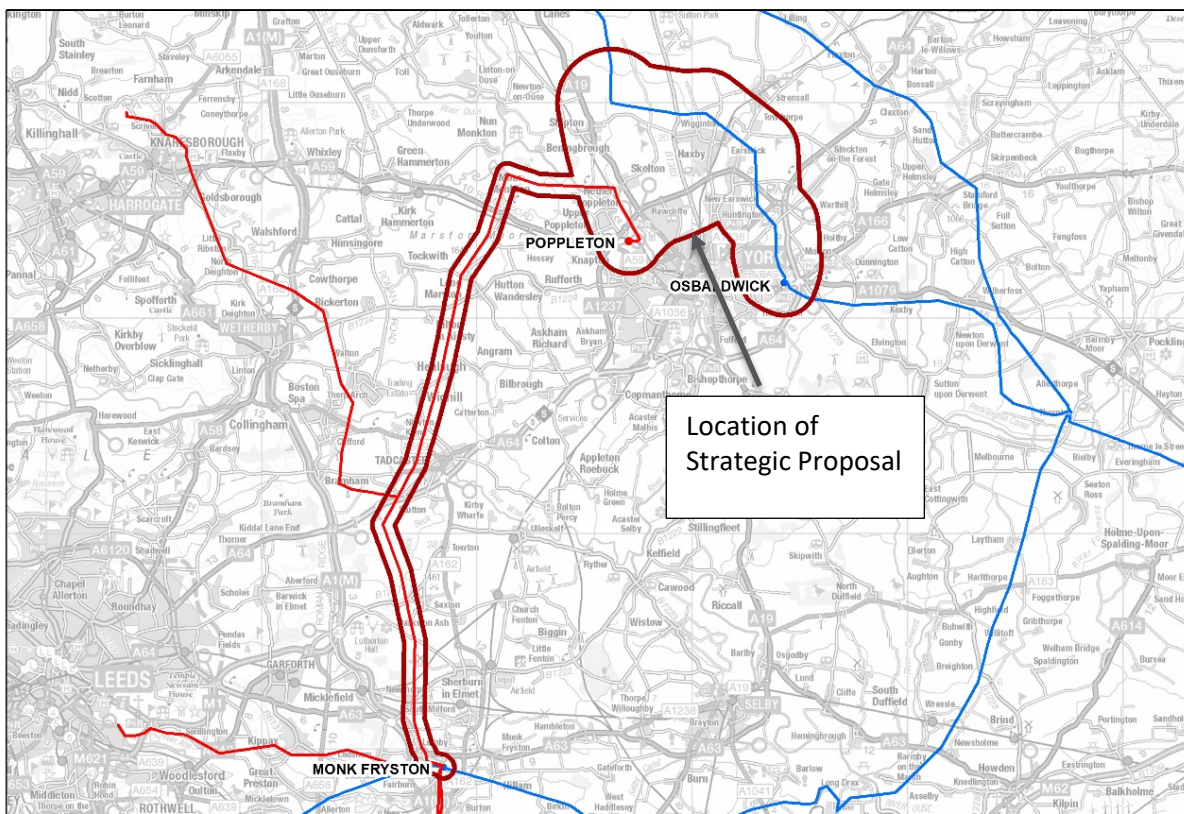
Figure 2.1 – Strategic connection options (2019)



2.2.3 A number of the strategic options had ‘start’ points located to the east of Poppleton and York which would have required longer new build routes around the south of York, resulting in the potential for greater environmental effects, in particular on landscape and views, as well as increased cost. Therefore, to minimise such effects options with ‘start’ points to the north or west of York were preferred. As a result, a preferred Strategic Proposal was identified (**Figure 2.2** indicates the location where this connection would be implemented) which would comprise:

- A new 6km 400kV overhead line which would provide a connection between the existing overhead line between Norton and Osbaldwick and Poppleton Substation.
- Works (known as reconductoring) to the existing overhead line between Poppleton and Monk Fyston to increase the capacity of this overhead line.

Figure 2.2 - 2019 Strategic Proposal (2020)



- 2.2.4 In 2020 additional projects which needed to connect to the National Grid electricity transmission network were identified that had not been considered previously. The equipment at existing substations at Poppleton and Monk Fryston could not accommodate the electricity flows from these additional projects and therefore Yorkshire GREEN was reviewed, and previous strategic options reconsidered.
- 2.2.5 Six new options, which were variants of previous options, were identified which comprised various options to build new substations at Monk Fryston, Poppleton or to the north-west of York. Some options would also involve the realignment of the existing overhead line between Monk Fryston and Poppleton.
- 2.2.6 The final preferred option selected as the ‘Strategic Proposal’ and taken forward for consent comprised a new 400kV overhead line which, as before, would connect to the existing overhead line between Norton and Osbaldwick but the proposal would also include a new substation to the north of York and a new substation at Monk Fryston. The new 400kV overhead line would connect to the new substation north of York, and the existing overhead line between Monk Fryston and Poppleton would be altered so that this also connected into the new substation north of York as well.
- 2.2.7 The other five options were discounted because they would involve longer connection routes or were considered to be less technically feasible. In addition, some of the options to construct a new substation at Poppleton were limited because of planned housing developments in this area. Some options would also introduce new electricity infrastructure into areas where none exists at present.

2.3 Identifying potential route corridors and substation locations

- 2.3.1 Following confirmation of the Strategic Proposal, a Corridor and Preliminary Routeing and Siting Study ('the CPRS Study') was undertaken to identify corridors for potential routes of the new overhead lines and potential locations for the new substations (as well as CSECs).
- 2.3.2 **Figure 2.3** illustrates the locations of the four route corridors identified (with the preferred corridor (B) shown in blue).

Figure 2.3 Potential route corridors

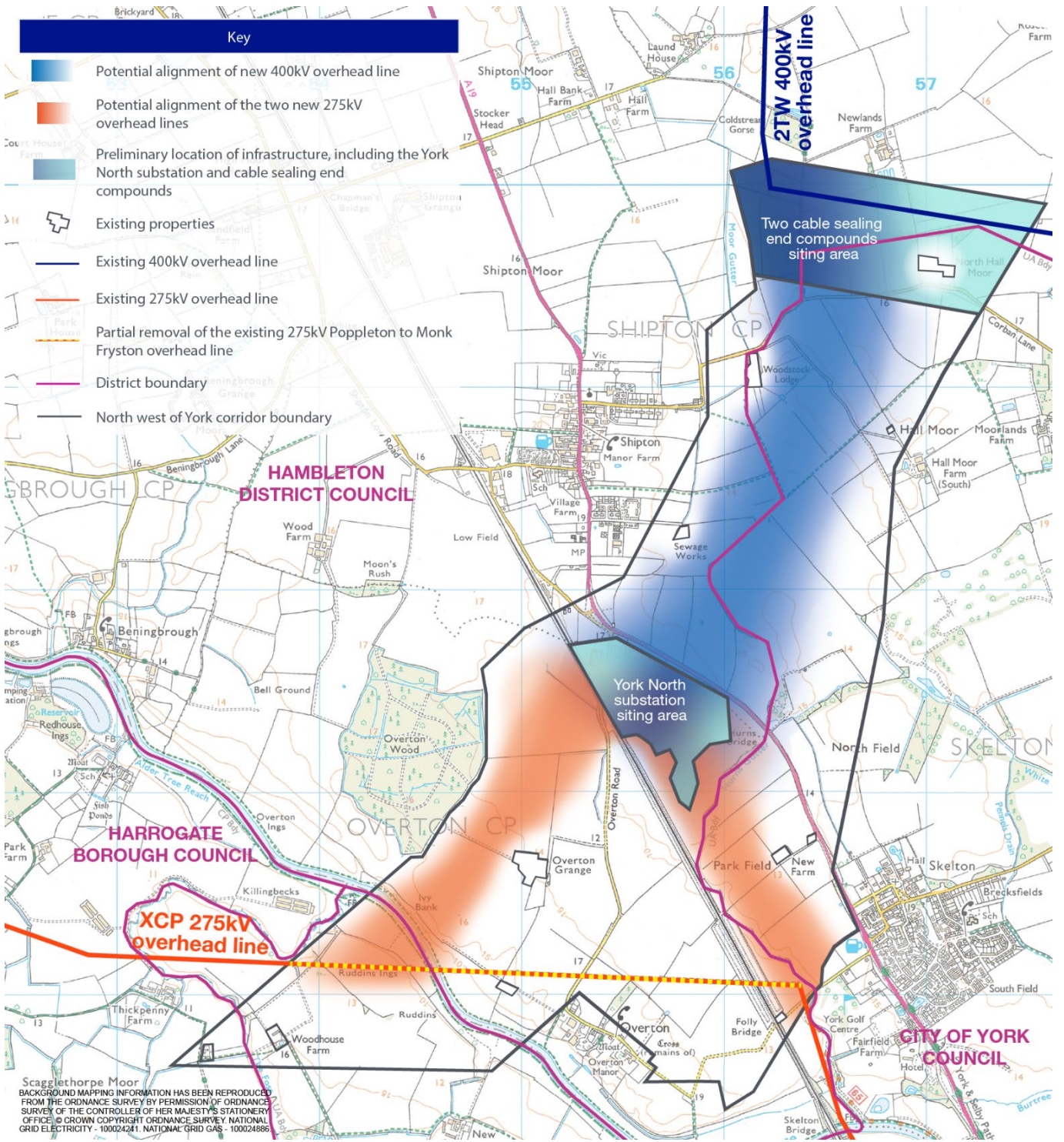


- 2.3.3 A preferred location for the new substation north of York (now known as Overton Substation) was identified south of Shipton by Beningbrough and adjacent to the East Coast Mainline Railway, which was located within corridor B (the preferred route corridor).
- 2.3.4 The new substation location was selected out of 12 potential location options because of its distance from residential properties (at least 800m), its closeness to the A19 (which would avoid construction traffic having to travel along minor roads) and because the substation could be located to avoid areas at higher risk of flooding. The substation site is an arable field which would limit the number of trees and length of hedgerow which may need to be removed to build the substation. In addition, there would be land for new planting to help minimise effects on the landscape and ecology if required.
- 2.3.5 Corridor B was selected as it would allow one of the shortest and most direct routes for the new 400kV overhead line where it would connect between the new substation and the existing Norton to Osbaldwick overhead line. It was also considered more compliant with a set of rules for identifying the alignment of overhead lines known as the Holford Rules.
- 2.3.6 The Strategic Proposal requires works to be undertaken on the existing overhead line to the south of Overton Substation which connects Monk Fryston and Poppleton Substations, to enable this overhead line to connect to the new Overton Substation. This would effectively 'split' this overhead line into two new overhead lines, partly using

and amending sections of the existing overhead line. Two overhead line options were identified and subject to consultation:

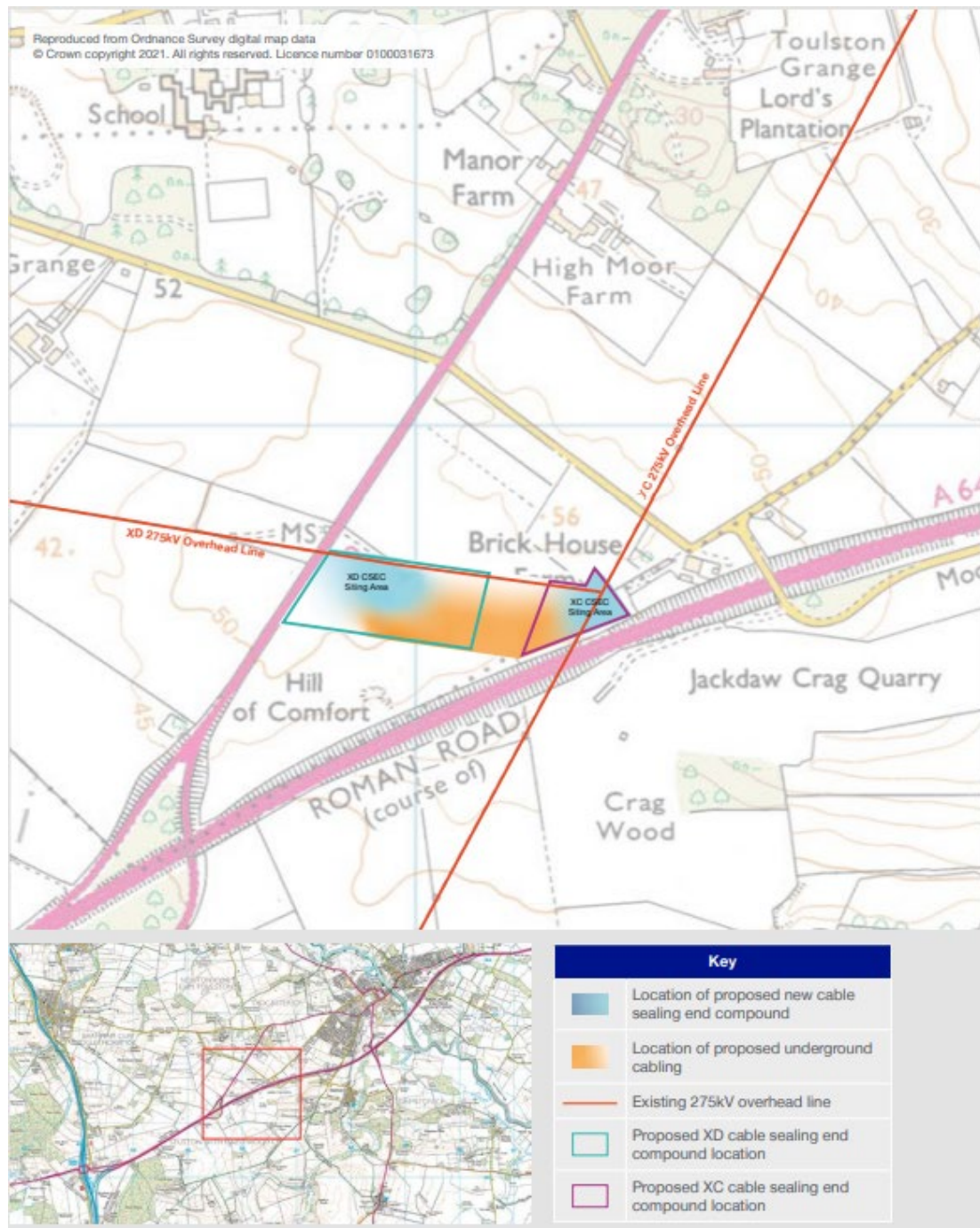
- Option 1 (**Figure 2.4**): A new section of overhead line running south-west from the proposed Overton substation, east of Overton Wood and across the River Ouse with a second new section running approximately parallel to the eastern side of the East Coast Mainline railway line. This option would enable the dismantling of up to 2.5km of the existing overhead line.
- Option 2 (**Figure 2.5**): Two new sections of overhead line broadly parallel with the East Coast Mainline railway line; one would be located to the eastern side of the ECML and the other to the west. This would enable the dismantling of up to 700m of the existing overhead line.

Figure 2.4 - Preferred corridor: Option 1



would also have greater impacts on the landscape and views, as they were in a slightly more elevated position with open views from Tadcaster.

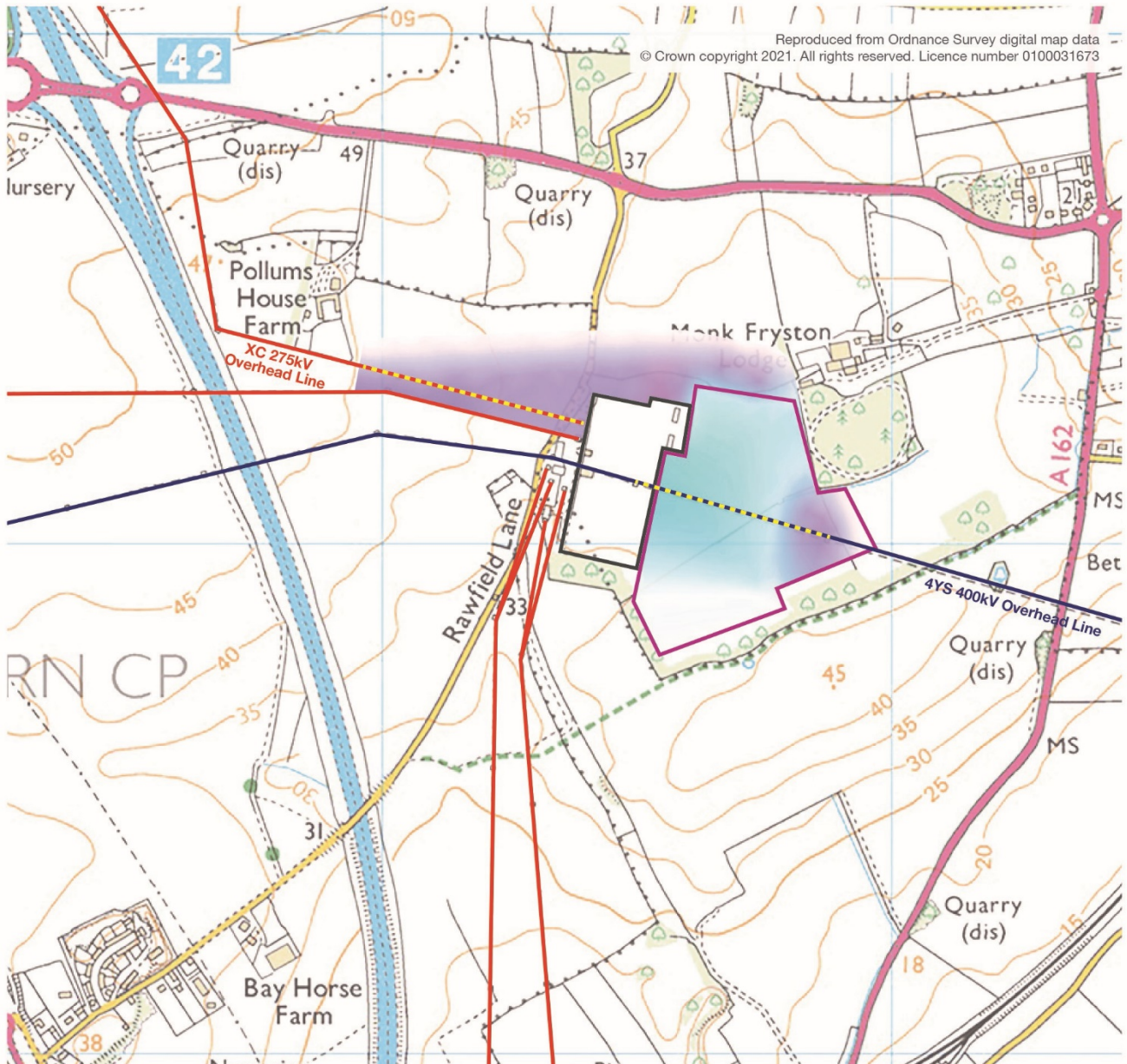
Figure 2.6 - Preferred locations for CSECs at Tadcaster



2.3.9 Finally, a preferred location for the new substation at Monk Fyston was selected to the east of the existing Monk Fyston substation (**Figure 2.7**). Three locations around the existing substation were considered and all would be likely to have similar effects on biodiversity, the landscape and views and all had good access from Rawfield Lane.

2.3.10 Although the selected location could have potential effects on Monk Fyston Lodge, a Grade II listed building located to the east, it is anticipated that planting and landscaping would reduce these effects. Building the proposed substation next to the existing substation would require less complex construction works and would also be more cost-effective.

Figure 2.7 - Preferred location for Monk Fryston substation



Key	
	Proposed location of associated infrastructure connecting to proposed, new MF3 substation
	Proposed location of new substation
	Existing 275kV overhead line
	Existing 400kV overhead line
	Partial removal of the existing 275kV XC/XCP overhead line (Poppleton to Monk Fryston)
	Partial removal of the existing 400kV 4YS overhead line (Monk Fryston to Eggborough)
	Proposed MF3 substation location
	Existing Monk Fryston substation

2.3.11 Further information on the justification behind the selection of these preferred locations can be found at <https://www.nationalgrid.com/uk/electricity-transmission/document/136186/download> .

2.3.12 These locations and options were consulted on during a public consultation which National Grid held between March and April 2021. The feedback from this informed the next stages of developing the Yorkshire GREEN design. Further information about the feedback received during the consultation can be found in the Yorkshire GREEN Non-Statutory Consultation Feedback Report available at <https://www.nationalgrid.com/uk/electricity-transmission/yorkshire-green>

2.4 Refining the Yorkshire GREEN design

- 2.4.1 Following consultation, further work was undertaken to refine the design and select a preferred route heading south from the new Overton Substation between Option 1 (**Figure 2.4**) and 2 (**Figure 2.5**).
- 2.4.2 Feedback on these two options was requested during consultation and varied, with more support for Option 1 than Option 2. Comments received related to issues such as:
- support for removal of the existing overhead line close to Overton but concerns about effects on Overton Wood (Option 1);
 - effects on the landscape and on the green belt as well as farm operations (Option 1); and
 - effects on views from Overton due to an increase in pylons and wires in the area running along the East Coast Mainline Railway (Option 2). There were also concerns that the additional pylons and wires could potentially increase the risks of birds colliding with overhead wires. However, some comments noted that concentrating the overhead wires along the railway corridor could limit effects on views from Overton village.
- 2.4.3 To determine a preferred alignment for the new overhead lines two route options north and two options south of Overton Substation were identified. All alignments were located within the areas shaded orange for Option 1 and 2 in **Figures 2.4** and **2.5**.
- 2.4.4 North of Overton Substation, a preferred alignment was selected that minimised effects on the landscape and views and was more compliant than other options with the National Policy Statement for Electricity Networks Infrastructure (EN-5) and guidance relating to the siting of overhead lines (The Holford Rules). The selected alignment was further from residential properties and was straighter and more direct.
- 2.4.5 South of Overton Substation, alignments were selected in line with the orange shaded areas shown for Option 1 as this would allow a longer section of existing overhead line to be removed north of Overton. This option was also considered to have fewer effects on the landscape and views compared with Option 2 where both overhead lines ran parallel to the East Coast Mainline.
- 2.4.6 The overhead line routes, individual pylon locations, substation and CSEC locations and access routes were then refined further using stakeholder feedback, on-going discussions with landowners and reviews by the engineering and environmental team as additional information about the Yorkshire GREEN location was obtained.
- 2.4.7 Refinements were made to the Yorkshire GREEN design to:
- include construction compounds, construction working areas and permanent and temporary access routes;

- ensure there was enough land to construct Yorkshire GREEN, but that the land needed to do this was minimised as far as possible at this stage, for example, ensuring property boundaries were followed wherever possible;
- ensure safe access for construction works, for example avoiding, where possible, vehicle access beneath scaffolding where access routes join the public highway;
- rearrange construction working areas to reduce potential environmental effects, for example to make sure there was sufficient distance between working areas and watercourses, moving working areas around pylons to avoid the need to divert or close a Public Right of Way, or remove ponds;
- move construction compounds and access routes at Overton Substation to reduce the loss of hedgerow; and
- locate pylons to make sure there is sufficient and safe clearance in height between the proposed overhead lines and features such as the East Coast Mainline railway, major roads and the River Ouse.

2.4.8 In some locations more detailed consideration was given to alternative options in the design and these included the following:

- Consideration of three different options for the proposed 400kV overhead line where it would connect to the existing overhead line to the north of Overton Substation. The selected option would result in no increase in pylon height, have a straighter route and have the least impact on agricultural operations.
- Consideration of two different options for the replacement of the existing overhead line south of Moor Monkton along a different alignment (and further away from the village) than the present overhead line route. The selected option would result in one less pylon and maximise the distance between the overhead line and the village.
- Consideration of four different access routes to a pylon on the existing overhead line near Newton Kyme. Two options were rejected as they could impact the listed buildings and scheduled monument at Newton Kyme, impact flood defences and increase construction traffic on minor roads. The remaining two options remain part of the Project design at this stage.

2.4.9 These design refinements have been incorporated into the design now being consulted on. Consultation on the information provided in the PEIR and the feedback received will be used to review and refine the Yorkshire GREEN design, where appropriate, prior to the submission of an application for development consent.

3. What is being proposed?

3.1 Key Components of Yorkshire GREEN

North-west of York Area

- Two new CSECs and associated underground cabling
- A new 400kV overhead line
- A new substation (Overton Substation)
- Two new sections of 275kV overhead line
- Works to the existing Monk Fryston to Poppleton overhead line
- Works to the existing Norton to Osbaldwick overhead line

3.1.1 These components are shown on **Figure 2**.

Cable Sealing End Compounds

3.1.2 Two CSECs, known as Shipton North and South, would be built approximately 1.5km north-east of Shipton each with a typical footprint of 40m by 50m and connected by underground cable. Both CSECs would be enclosed with security fencing and have access routes. The CSECs would allow the existing overhead line between Norton and Osbaldwick to connect to the new 400kV overhead line. The image below shows a typical CSE compound with a gantry.

Graphic 3.1 - Typical gantry



400kV overhead line

- 3.1.3 A new 400kV overhead line would be approximately 2.8km in length with eight pylons up to a height of 55m. It would be aligned north-south connecting the existing Norton to Osbaldwick overhead line with the new Overton Substation.

Overton Substation

- 3.1.4 Overton Substation would be located approximately 1km south of Shipton between the A19 and the East Coast Mainline railway. The substation would convert the voltages from the higher voltage 400kV overhead line to the north to the lower voltage 275kV overhead lines to the south.
- 3.1.5 The substation would include electrical components and equipment such as transformers, switch room, control building and welfare facilities. Some equipment would be placed outdoors, and other equipment would be housed in buildings or enclosures. At this stage, it is assumed the substation would be unmanned with an overall footprint of 8.2ha and a maximum height of 15m. The area around the substation would include security fencing, access roads as well as planting and if needed, earthbunds to help screen the substation in views. Images of a typical substation and layout are provided below.

Graphic 3.2 – Image of typical substation (existing Monk Fryston Substation)



Graphic 3.3 – Typical substation layout



Two new sections of 275kV overhead line

- 3.1.6 Two new sections of 275kV overhead lines would connect to Overton Substation from the south.
- Western overhead line: Known as the 'XC' overhead line, this would be 2.1km in length with six new pylons running from south of the River Ouse, east of Overton Wood and crossing the East Coast Mainline with pylons up to a maximum height of 59m.
 - Eastern overhead line: Known as the 'SP' overhead line, this would be 1.5km in length with four new pylons running from 500m west of Skelton and parallel to the east of the East Coast Mainline railway with pylons up to a maximum height of 60m.
- 3.1.7 The installations of these new sections of overhead line would require the existing Monk Fryston to Poppleton overhead line to be modified to form two separate overhead lines: the XC overhead line connecting between Monk Fryston and Overton Substations and the SP overhead line connecting between Poppleton and Overton Substations, as shown on **Figure 2**.

Works to the existing Monk Fryston to Poppleton overhead line

- 3.1.8 Works would be undertaken to a 5km section of this overhead line between Moor Monkton in the west and Skelton in the east.
- A 2.4km section (and six pylons) of the existing overhead line between the East Coast Mainline railway in the east and Woodhouse Farm, north of Overton to the west would be permanently removed.
 - Four pylons along a 1.2km section of the existing overhead line south of the River Ouse and north of Thickpenny Farm would be removed and replaced. The pylons would be replaced along the same overhead line alignment, but in new locations and be taller in height than the existing pylons. The new pylons would be between 48m and 54m above ground level compared to 40m to 50m in height at present.
 - A 1.6km section of overhead line south of Moor Monkton and Redhouse Wood would be removed with the replaced section moved further south away from Moor Monkton. The closest pylon to Moor Monkton would be removed so that there would be one less pylon along this overhead line. The new pylons would be between 50m and 53m above ground level compared to 35m to 45m in height at present.

Works to the existing Norton to Osbaldwick overhead line

- 3.1.9 One pylon along this overhead line south-west of Newlands Farm would be removed and replaced approximately 30m to the east. The replacement pylon would be approximately 11m taller than the existing pylon and would also have wires connecting downwards into one of the new CSECs.

Tadcaster Area

- Two new CSECs and associated underground cabling
- Works to the existing overhead line between Tadcaster Tee and Knaresborough

Cable sealing end compounds

- 3.1.10 Two CSECs, known as Tadcaster Tee East and West, each with a typical footprint of 40m by 50m and connected by underground cables. For both CSECs, security fencing would be installed as well as the construction of a permanent access. The CSECs would be needed to manage the increase in power flows as a result of works to the existing overhead lines in this area. **Figure 3** shows the location of the CSECs.

Works to the existing overhead line between Tadcaster Tee and Knaresborough

- 3.1.11 One pylon on this existing overhead line in the land between the A64 and A659 would be removed and replaced approximately 40m to the south-east along the same section of overhead line. The replacement pylon (46m above ground level) would be approximately 8m taller than the existing pylon and would have wires connecting downwards into the Tadcaster Tee West CSEC.

Monk Fryston Area

- A new substation (proposed Monk Fryston Substation)
- Works to the existing Monk Fryston to Poppleton overhead line
- Works to the existing overhead line between Monk Fryston and Eggborough

- 3.1.12 **Figure 4** shows these components.

The proposed Monk Fryston Substation

- 3.1.13 The proposed Monk Fryston Substation would be installed next to (and connect to) the existing substation at Monk Fryston off Rawfields Lane.
- 3.1.14 The substation would include electrical components and equipment such as transformers, switch room, control building and welfare facilities. Some equipment would be placed outdoors, and other equipment would be housed in buildings or enclosures. At this stage it is assumed the substation would be unmanned and would have an overall footprint of 8 hectares. It is likely to be similar in height to the buildings and infrastructure at the existing substation (assumed to be up to a maximum height of 15m). The area around the substation would include security fencing, access roads as well as planting and if needed, earthbunds to help screen the substation in views. These could comprise mounds of earth of limited height which would be planted and located close to the boundaries of the substation.

Works to the existing Monk Fryston to Poppleton overhead line

- 3.1.15 A 1.5km section of the existing overhead line west of the existing Monk Fryston substation would be realigned so that it would connect into the new substation. The four existing pylons along this section of overhead line would be removed and replaced, north of the existing alignment. As a result of needing to connect this overhead line into the new substation, there would be one more pylon compared to the existing situation. The replacement pylons would be up to 59m above ground level in height compared with the pylons to be dismantled which range in height from approximately 35m to 42m above ground level.

Works to the existing overhead line between Monk Fryston and Eggborough

- 3.1.16 A short section of this existing overhead line to the east of Monk Fryston substation would be removed and a new overhead line introduced, slightly to the north but along a similar alignment, to connect into the new substation. As a result, a section approximately 350m long would be permanently dismantled.

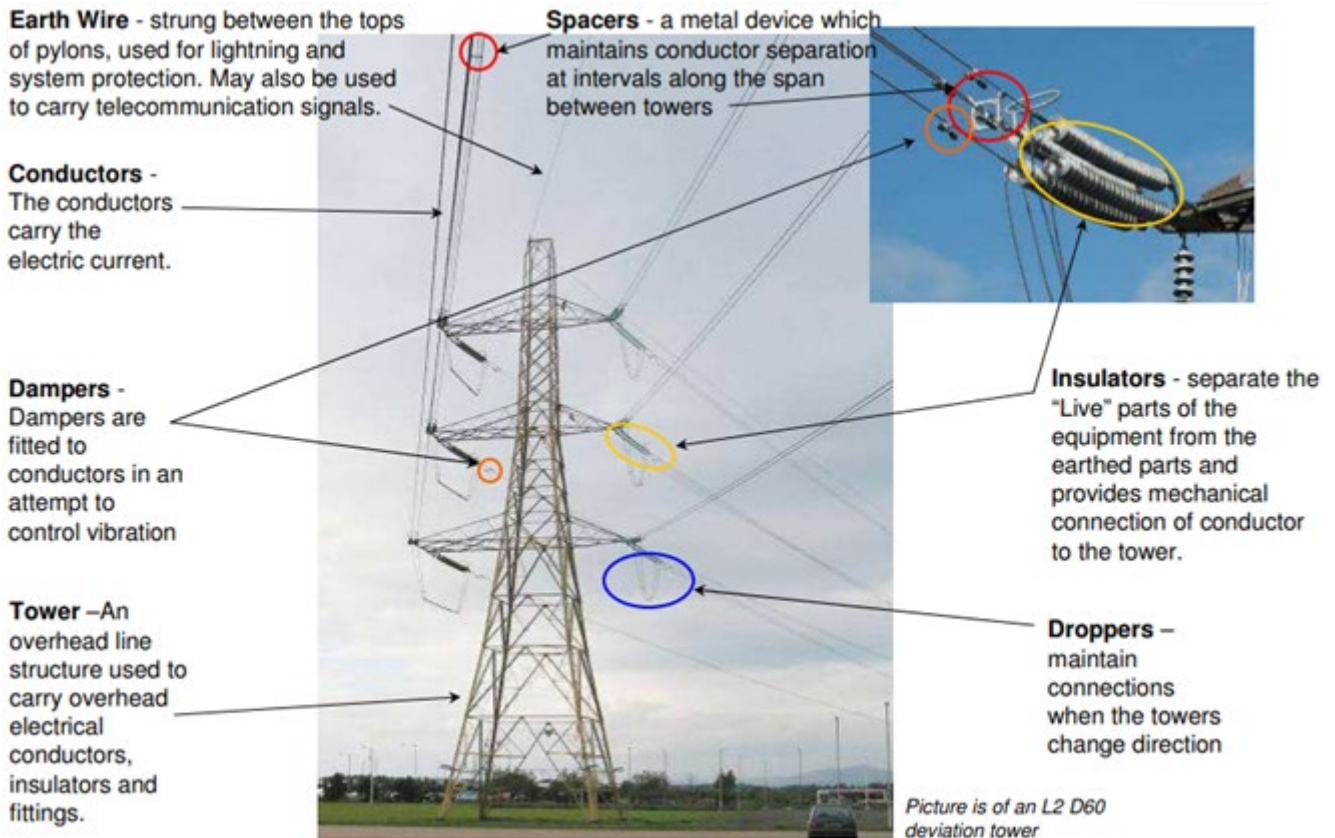
Works to existing infrastructure

- Works to the existing Monk Fryston to Poppleton overhead line (between Moor Monkton – Tadcaster – A1(M)/A63 junction)

Works to the existing Monk Fryston to Poppleton overhead line (between Moor Monkton – Tadcaster – A1(M)/A63 junction)

- 3.1.17 In the area between Moor Monkton and where the existing overhead line crosses the A63 close to its junction with the A1(M), works; known as reconductoring, would be undertaken to change the wires (conductors) which are strung from pylons and insulators on this section. Other works that would be undertaken to some of the pylons include replacing or strengthening the steelwork on the pylons, replacing or modifying the cross arms and repairs to or strengthening of the pylon foundations. **Graphic 3.4** shows the key components on a typical pylon.

Graphic 3.4 – Pylon component



Osbalwick Substation

- 3.1.18 A new circuit breaker (device for stopping the flow of current in an electric circuit as a safety measure) and isolator (device used for isolating a circuit or equipment from a source of power) along with associated cabling would be installed at Osbalwick Substation and minor works would be undertaken on one existing pylon. A gantry (**Graphic 3.1**) (an overhead bridge-like structure supporting equipment) would be removed and dismantled to free up space for new equipment. A new gantry (assumed to be up to a maximum height of 15m and of similar height to the existing gantry) would be installed on existing operational land at the substation with a new underground cable connection to the existing substation. All construction works would take place within current operational land at Osbalwick Substation.

3.2 Construction works

- 3.2.1 The construction works for Yorkshire GREEN would comprise the following key activities:
- Access routes: Access routes to construction working areas would be implemented prior to any works commencing to provide suitable access for construction plant and traffic. Where required, vegetation removal and management may be necessary to access the public highway and ensure the design meets visibility safety requirements. The access surfaces would comprise stone or interlocking panels (that form a suitable surface to drive vehicles and plant along). Existing access routes would also be used in some places. The access routes would be fenced and would also include the installation of drainage, and where required watercourse crossings.
 - Construction compounds: A total of eight construction compounds (shown on **Figure 2** to **Figure 4**) would be installed for Yorkshire GREEN each of which would have a footprint of approximately 1.4 hectares (130m by 110m). Each compound is likely to contain storage areas including laydown areas and soils storage and areas for equipment and fuel, drainage, generators, car parking and offices and welfare areas (portacabins). The compounds would be located as follows (in each of the locations listed there would be two compounds):
 - north of Corban Lane and east of the access road to Newlands Farm close to where the proposed 400kV overhead line would connect to the existing overhead line;
 - north-west of the proposed Overton Substation; one to the west of Overton Road and north of the East Coast Mainline railway and the second to the east of Overton Road and south of the A19;
 - in land between the A64 and A659 at Tadcaster; and
 - east and west of Rawfield Lane at Monk Fyston.
 - Construction working areas: These are set up to provide a secure area within which works could take place. Around the pylons a typical working area of 50m by 50m would be set up and would also be set up around equipment needed to lift infrastructure onto the pylons.
 - Scaffolding: This would be installed where overhead lines need to cross features such as roads, railway and rivers to ensure such features are protected and prevent overhead lines coming into contact with these features.

Construction working hours

- 3.2.2 Twenty-four hour working would be implemented during the construction works and commissioning for Overton and Monk Fryston Substations and overnight (24 hour) working used to install the overhead lines crossing the East Coast Mainline railway, highways and other infrastructure to minimise daytime closures of these transport links. For other components of Yorkshire GREEN, at this stage, it is assumed that construction work would be limited to daytime hours but would take place seven days per week.

Pylon construction, repair and dismantling works

- 3.2.3 New pylons would be constructed by installing the foundations and then assembling the pylon steelwork, bolting elements together prior to lifting them into place using a crane. The final stage is to install the wires onto the pylons. This is completed using special equipment which pull the wires up onto and along the pylons in sections. The wires are then installed to the correct tension.
- 3.2.4 The works to the existing overhead lines would include repairs or strengthening to the pylon foundations, if surveys show these are needed, replacement of steelwork and changes to the wires would be undertaken using similar methodologies to those described for new overhead lines.
- 3.2.5 Pylons are dismantled by removing the fittings and overhead lines, then taking apart the steelwork in sections using a crane or ‘felling’ the whole structure. Foundations would be removed to a specified depth, any excavated land filled in and the ground conditions reinstated.

Temporary overhead line diversions

- 3.2.6 During construction National Grid has to ensure that electricity flows are maintained at all times along the existing overhead lines and therefore in some places temporary diversions would be needed. These typically comprise a short section of overhead line with temporary structures or pylons which electricity flows are diverted along. Such diversions would be implemented at the following locations.
- Along the existing Norton to Osbaldwick overhead line a temporary diversion of approximately 1.1km would be installed approximately 130m north of the current overhead line with two temporary structures or pylons approximately 185m south-west and 280m south-east of Newlands Farm.
 - Along the existing Tadcaster Tee to Knaresborough (XD/PHG) overhead line, a temporary diversion of approximately 1km long and up to 60m north of the existing overhead line with two temporary structures approximately 110m east and 150m west of the A659.
 - Along the existing Poppleton to Monk Fryston overhead line there would be four sections of temporary diversion:
 - a 1.9km temporary diversion approximately 50m north of the existing overhead line along the realigned overhead line into Overton Substation;
 - an 820m temporary diversion approximately 30m south of the existing overhead line and north of Woodhouse Farm;
 - a 565m long temporary diversion south-east of Moor Monkton approximately 40m west of the existing overhead line; and

- a 1km temporary diversion west of Monk Fryston Substation up to approximately 40m north and east of the existing overhead line with two temporary structures or pylons installed approximately 170m south-west and 160m south-east of Pollums House Farm.

Construction of CSECs

- 3.2.7 Once working areas were established this would involve the installation of underground cabling, although at Tadcaster it is assumed at this stage that horizontal directional drilling would be used to install the cable due to the presence of gas pipelines with appropriate health and safety measures implemented. Cable drums would be delivered to site and cables winched into position along the trench and the trench filled back in.

Construction of substations

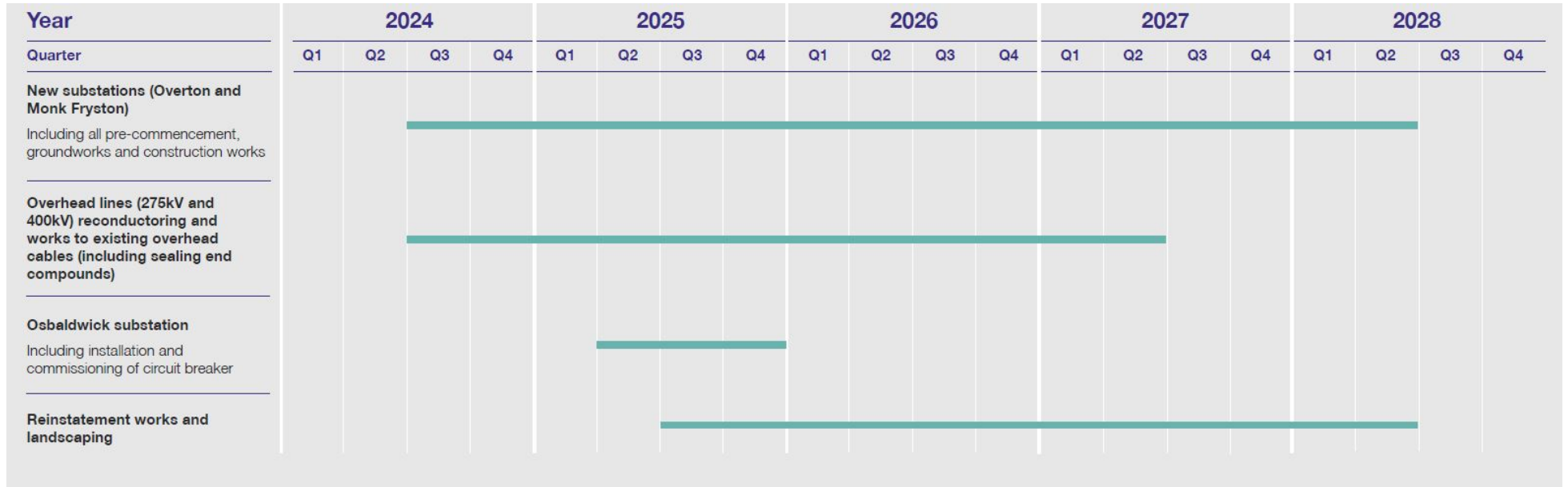
- 3.2.8 The areas where Overton Substation and Monk Fryston Substation are to be built would be cleared and levelled to create a level platform upon which the substation could be constructed. At this stage it is assumed that any cleared material or soils would be used to create landscape bunds around the substations. These bunds would then be planted to help screen the substations. Concrete would be installed to form the foundations of the substations, drainage installed, and underground cabling. The structures and equipment within the substation would be installed and constructed on the prepared concrete foundations. A control building would be built and connected to electricity and water supplies as well as the drainage system. Finally, equipment to protect and control the electricity network would be installed or modified and the new and modified overhead lines tested before being commissioned.

3.3 What is the timeline for construction and operation of Yorkshire GREEN?

Construction

- 3.3.2 Construction works are expected to start in 2024 and continue for a period of up to four years (2028) with Yorkshire GREEN becoming operational from September 2027 (see **Graphic 3.5**).

Graphic 3.5 – Indicative construction programme



Operation

- 3.3.3 The operational lifetime of Yorkshire GREEN is expected to be around 80 years. Periodic inspection and maintenance of Yorkshire GREEN would be required during its operational lifetime. Maintenance activities are likely to include visual expectations, repairs to pylon foundations, steelwork and fittings and servicing of equipment at substations.

Decommissioning

- 3.3.4 Even though the expected life span of Yorkshire GREEN is around 80 years, the lifespan of components such as the overhead lines may be longer, depending on their condition and any future refurbishments. Decommissioning is only likely to occur once the infrastructure is no longer required. Whilst it is assumed that aspects of the connection could be removed at the end of life, it is too early to determine this.
- 3.3.5 It is expected that any dismantling of the infrastructure would be completed in a similar manner to the construction phase. It is assumed that effects during the decommissioning phase would be of a similar nature to activities conducted during the construction phase.

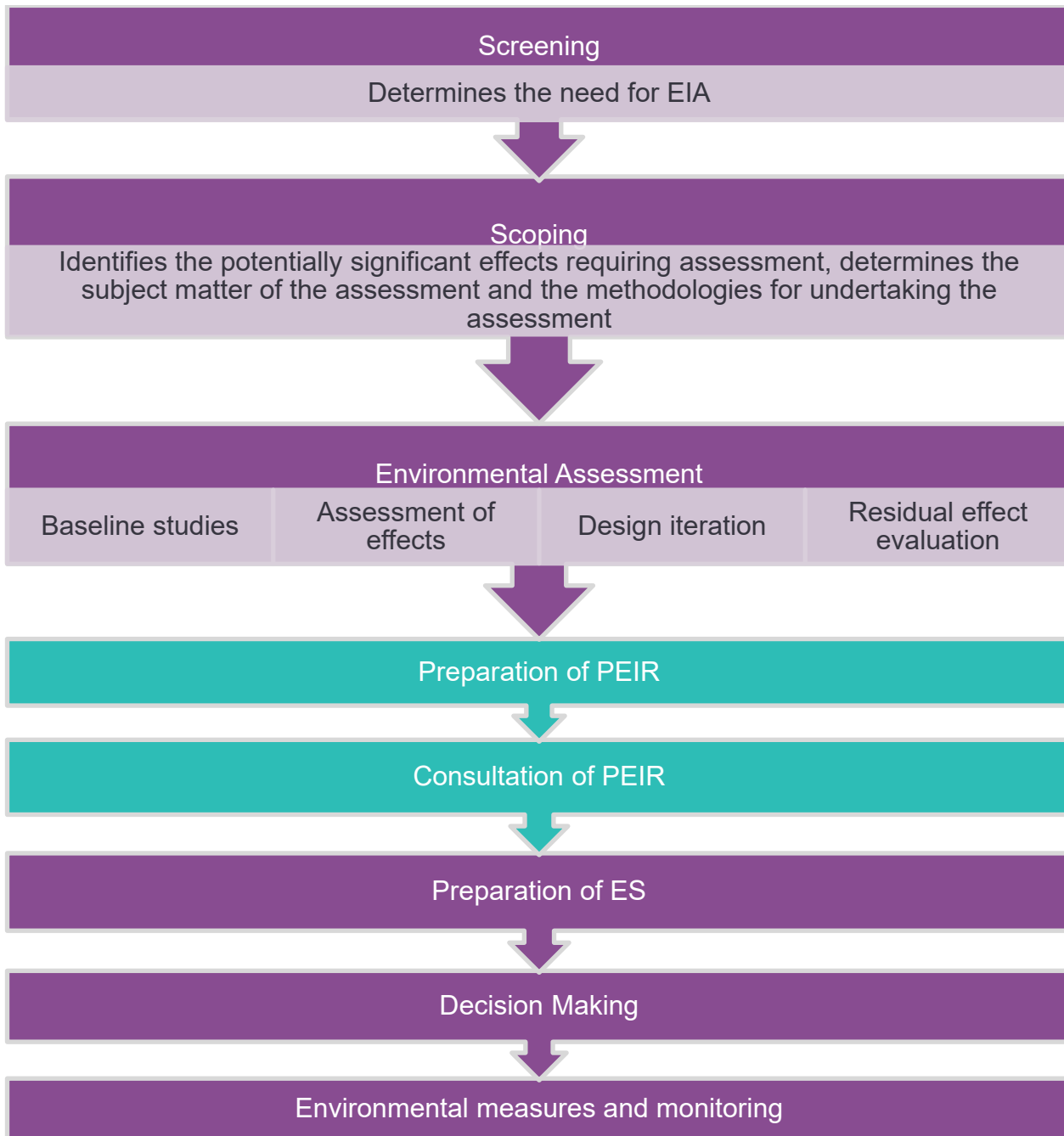
4. Preliminary environmental impact assessment

- 4.1.1 The PEIR presents a preliminary assessment of the likely significant environmental effects of Yorkshire GREEN to inform consultation on the Project. Assessment work will continue and the updated assessment will be reported in the Environmental Statement (ES) submitted to support the Development Consent Order (DCO) application.

4.2 What is the Preliminary Environmental Information Report?

- 4.2.1 The PEIR has been prepared at a point in time during the EIA process when the design of Yorkshire GREEN is still being refined, the likely significant environmental effects are still being assessed and the potential for environmental measures is being fed back into the design. The purpose of the preliminary assessment presented in the PEIR is to enable members of the public, consultation bodies, and other stakeholders, to develop an informed view of the likely significant effects of Yorkshire GREEN, and comment on aspects of interest. National Grid is working with stakeholders to develop additional ways in which the potential negative effects of Yorkshire GREEN, identified by this assessment, can be avoided or reduced. Feedback received through the consultation process will be used by National Grid to inform the ongoing development of Yorkshire GREEN design, and additional measures to address any identified significant environmental effects.
- 4.2.2 The full findings of the EIA process will be presented in an ES that will be submitted as part of the application for development consent. The ES provides the public and relevant organisations (such as the Environment Agency and Natural England) with the environmental information needed to understand and comment on a development and provides decision-makers with the environmental information to allow a decision to be made whether to grant consent for the development.
- 4.2.3 Key aims of the EIA process are to understand the current environmental conditions (the 'baseline') and how those conditions may change in the future as a result of a proposed development. Those changes are assessed in terms of how 'significant' they would be, and EIA is primarily concerned with 'likely significant effects' and not those considered unlikely to be significant. The EIA process also identifies and incorporates environmental measures (often referred to as 'mitigation') to avoid, reduce or offset any likely significant negative effects, which includes opportunities to enhance the environment through design.
- 4.2.4 The EIA process and the position of the PEIR within this is summarised in **Graphic 4.1**.

Graphic 4.1 - The EIA process



4.3 Scoping and engagement

4.3.1 Engagement has been undertaken with consultees, stakeholders and other interested organisations.

Early engagement

4.3.2 Central to the delivery of the EIA has been, and will continue to be, the focus on engagement with consultation bodies, community stakeholders, and other interested organisations and individuals.

- 4.3.3 A Scoping Report was submitted to the Planning Inspectorate in March 2021. The Scoping Report identifies the potentially significant effects requiring assessment, determines the subject matter of the assessment and the methodologies for undertaking the assessment. The Planning Inspectorate subsequently provided a Scoping Opinion, which included comments from a range of stakeholders, on behalf of the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS), in May 2021. The Scoping Opinion and the statutory consultee responses have subsequently informed the assessment work and further design evolution undertaken to date.

Informal consultation and engagement

- 4.3.4 A programme of ongoing informal consultation and engagement is also underway with key stakeholders including, but not limited to, the Environment Agency, Natural England, Historic England, National Highways and local authorities to inform Yorkshire GREEN design at an early stage.
- 4.3.5 This PEIR has also been informed by an informal consultation run by National Grid between 11 March 2021 and 15 April 2021. This consultation introduced Yorkshire GREEN, the development process, and shared information on the emerging design process inviting feedback from stakeholders. All feedback is detailed within the Non-Statutory Consultation Feedback Report which is provided alongside the PEIR.
- 4.3.6 In addition, National Grid has met with the Planning Inspectorate to provide updates on scoping, the design evolution activities and the approach to the EIA.

4.4 Assessment methodology

- 4.4.1 EIA is a process for identifying the likely significant environmental effects (positive and negative) of a proposed development to inform the decision-making process for development consent to be granted.
- 4.4.2 The EIA considers all relevant topics that may be impacted, such as landscape, historic environment etc. The topics to be included in the EIA were agreed with the Planning Inspectorate and other stakeholders through the Scoping process, with the Planning Inspectorate providing a Scoping Opinion. This document provides an opinion on what information should be included within an ES.
- 4.4.3 The PEIR presents the preliminary EIA findings which are based on the information available at this stage of the process and Project. A separate PEIR chapter presents the detailed findings for each topic that has been assessed.
- 4.4.4 A detailed description of the existing 'baseline environment' has been produced for the draft Order Limits, and where appropriate the area around the limits, through a combination of desk-based studies, consultation and site-specific surveys.
- 4.4.5 All 'potential effects' arising from the construction, operation and decommissioning of Yorkshire GREEN are identified as part of the EIA methodology, for example loss of habitat or change in noise levels. The assessment considers the level of significance of each effect on each 'receptor' (the receiving environment such as water, air, land, or specific species). The assessment is undertaken by EIA specialists such as ecologists and archaeologists. The general approach to determining 'significance' of an effect is to consider the sensitivity of a receptor alongside the nature and severity of the change. A detailed explanation of how different effects are deemed significant for each aspect is provided in each topic chapter of the PEIR.

- 4.4.6 All potential effects are considered as part of the EIA process. However, 'likely significant effects' are the key issues that are identified when considering the level and type of effect and the sensitivity of the environmental receptor.
- 4.4.7 EIA also requires the consideration of potential cumulative and interrelated effects:
- cumulative effects are where the combined effect of Yorkshire GREEN in combination with the effects from a number of different projects, on the same single environmental receptor/resource are considered; and
 - inter-related effects are those that arise from multiple impacts and activities from the construction, operation and decommissioning of Yorkshire GREEN on the same receptor, or group of receptors.
- 4.4.8 At this stage a preliminary assessment has been undertaken to identify the planned developments within the area around Yorkshire GREEN which have the potential to result in cumulative effects.

4.5 Embedded environmental measures

- 4.5.1 EIA is an iterative process and opportunities for environmental mitigation, referred to as 'embedded environmental measures' have been considered throughout the design development of Yorkshire GREEN and in the assessment undertaken for the PEIR where likely significant effects have been identified. Where possible, these measures have been developed with input from key stakeholders together with appropriate technical standards, policies and guidance. These embedded environmental measures include avoidance, best practice and design commitments.

4.6 Topics scoped out of the PEIR

- 4.6.1 There are some aspects for which a detailed assessment has not been undertaken because the potential for significant effects from these aspects is unlikely. Where appropriate, this has been agreed with the Planning Inspectorate.
- Electro Magnetic Fields (EMF): Yorkshire GREEN will be designed in accordance with Government adopted technical guidelines on EMF. As all infrastructure proposed as part of the Project would be compliant with these guidelines no significant effects would occur.
 - Major accidents and disasters: Measures will be incorporated into the design and risk assessments implemented during construction to ensure the likelihood of major accidents and disasters is very low. The main accident risk relates to underground high pressure gas pipelines near to the Project. Measures, which will be agreed with the pipeline operators, will be implemented to ensure accidents are avoided and works are carried out safely during construction.

4.7 Reporting EIA assessment results

- 4.7.1 The EIA process will culminate in the production of an ES written in accordance with the EIA Regulations 2017, which will help inform the determination of the application for a DCO. The ES will provide an assessment of the likely significant effects associated with the construction, operation and maintenance, and decommissioning phases of Yorkshire GREEN which will help to inform decision-making.

4.7.2 The EIA for a DCO is reported in two stages:

- the PEIR, prepared to inform consultation with the public and other stakeholders about Yorkshire GREEN and its likely significant environmental effects; and
- the ES, prepared to accompany the DCO application.

4.7.3 The PEIR is comprised of:

- Volume 1: Non-Technical Summary (this report);
- Volume 2: The PEIR;
- Volume 3: Appendices; and
- Volume 4: Figures.

5. Preliminary Environmental Assessment

5.1 Introduction

5.1.1 This section provides a summary of the preliminary assessment of likely significant effects to resources and receptors including:

- Landscape and Visual;
- Historic Environment;
- Biodiversity;
- Hydrology and Flood Risk;
- Geology and Hydrogeology;
- Agriculture and Soils;
- Traffic and Transport;
- Air Quality;
- Noise and Vibration;
- Health and Wellbeing; and
- Socio-economics.

5.2 Landscape and visual

5.2.1 This chapter summarises the assessment findings at this point in the EIA process for Landscape and Visual, based on Chapter 6 of the PEIR.

How landscape and visual effects have been assessed

5.2.2 Landscape receptors are distinct areas that could be influenced by Yorkshire GREEN where both natural and human factors combine to define landscape character. Visual receptors are people in different situations that may experience views of Yorkshire GREEN, including residents, people using transport routes and users of public rights of way and other recreational areas or receptors such as parks. The assessment methodology is based on current guidance produced by the Landscape Institute and Institute of Environmental Management and Assessment (IEMA).

5.2.3 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN on landscape and visual receptors in the Study Area, including direct and indirect effects on landscape character and a local landscape designation scoped into the assessment. The Study Area extends 3km from the edge of the new infrastructure works at North-west of York, Tadcaster Area and Monk Fryston Substation Area. The new infrastructure works assessed are new overhead lines, the new substations at Overton and Monk Fryston, new CSECs at Shipton and Tadcaster and temporary works associated with the construction phase including compounds and overhead lines. Effects have been considered for when Yorkshire GREEN is being constructed and once it is operational. An assessment has been undertaken at Year 1 Operation, once

all construction and reinstatement works have been completed and also at Year 15 Operation (15 years from completion of building Yorkshire GREEN), to consider the potential effects following the growth of new tree and shrub planting.

- 5.2.4 Baseline information has been obtained from a desk-based study including review of published landscape character assessments. Computer modelling has generated a Zone of Theoretical Visibility (ZTV) which provides mapping of the areas from where the Yorkshire GREEN elements could be visible. This has been used as part of the process to select draft viewpoints which were then checked and refined with a field survey. Photographs from a number of publicly accessible viewpoints were taken in March 2021.
- 5.2.5 In addition, in order to understand the existing landscape and visual environment and associated potential issues, initial engagement has taken place with officers at local planning authorities and this process is ongoing. Feedback on the Scoping Report from PINS and others has been incorporated into the preliminary landscape and visual assessment.

Baseline environment

- 5.2.6 Established electricity transmission infrastructure comprising high voltage overhead lines and the Monk Fryston Substation are located within the Study Area. The existing infrastructure is part of the baseline environment against which changes including the decommissioning of sections of overhead line and the introduction of proposed new infrastructure is assessed.
- 5.2.7 The North-west of York Study Area is dominated by medium to large scale arable fields on low lying land, crossed by several transport routes including the A19 and East Coast Mainline railway. The proposed infrastructure in the Tadcaster study area is located approximately 1.4km to the south-west of Tadcaster on gently undulating arable farmland between the A659 and A64 dual carriageway. In the Monk Fryston Study Area, the proposed substation lies adjacent to the eastern and north-eastern edge of the existing substation on relatively flat land. Mature woodland belts are located to the south and east, set within a wider undulating arable landscape, influenced by major transport corridors including the A1(M).
- 5.2.8 The Locally Important Landscape Area is a non-statutory local landscape designation within the Tadcaster Area and Monk Fryston Substation study areas.
- 5.2.9 The published national and regional landscape character assessments were reviewed to provide context and Statements of Environmental Opportunity informed the outline landscape strategy. The published local landscape character assessments were used as the primary source of baseline information to describe the key characteristics of the landscape within the study area and included the following assessments:
- The Hambleton Landscape Character Assessment and Sensitivity Study;
 - Harrogate District Landscape Character Assessment;
 - York Historic Environment Characterisation Project;
 - Selby District Council Landscape Character Assessment;
 - Leeds Landscape Character Assessment; and
 - Wakefield Landscape Character Assessment.

5.2.10 Visual receptors within the Study Area have been identified as residents within settlements and residents of scattered dwellings and farmsteads. Recreational receptors include cyclists on national cycle routes, walkers on the York and Selby long distance path, users of public rights of way and people in boats on the river corridors, most notably the River Ouse north-west of York. Other recreational areas or receptors include parks, recreation grounds and golf courses. Transport network receptors include people travelling in vehicles along roads and passengers on trains.

Embedded environmental measures

5.2.11 A range of environmental measures which relate to landscape and visual matters are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- Guidance prepared by National Grid on factors to consider in deciding the route of new overhead lines and identifying locations for new substations (known as The Holford and Horlock Rules) have been followed in the earlier stages of Yorkshire GREEN when potential overhead line and substation options were being identified so that adverse landscape and visual effects were minimised as much as possible within the technical parameters required to deliver Yorkshire GREEN;
- Potential adverse impacts from constructing Yorkshire GREEN were taken into account when deciding where to locate construction compounds. The construction works will also include the use of temporary earth bunding to the edge of construction compounds and sensitive temporary lighting design to minimize effects from lights at night time;
- Project infrastructure such as pylons and substations, has been located to avoid loss of hedgerows and trees where possible;
- In line with good practice, landscape management plans will be prepared as part of the application for development consent to detail how trees and hedgerows will be protected during construction and operation; and
- An outline landscape strategy submitted with this preliminary assessment indicates the potential locations of new planting, comprising hedgerow reinforcement with new planting as well as new hedgerow, tree and woodland planting.

Likely significant effects

5.2.12 There is the potential for a number of significant adverse effects from Yorkshire GREEN on landscape and visual receptors. During the construction phase these include the potential impact upon the Huby and Shipton Vale Local Landscape Character Area and the visual receptors listed below.

North-west of York Area:

- Residents of some dwellings on Scagglethorpe Moor;
- Cyclists on National Cycle Route 65 on Overton Road;
- Recreational users of the River Ouse corridor, south of Overton Wood;
- Users of the public right of way network east of Shipton-by-Beningbrough;

- Users of the Other Route with Public Access (ORPA) west of Newlands Farm;
- People in vehicles on the A19 between Skelton and Shipton-by-Beningbrough; and
- People in vehicles on Overton Road.

Tadcaster Area:

- People in vehicles on the A659; and
- Residents of Red Brick House Farm.

Monk Fryston Substation Area:

- Residents of Pollums House Farm; and
- People in vehicles on Rawfield Lane.

5.2.13 There is also the potential for significant adverse effects from new infrastructure on the Huby and Shipton Vale Landscape Character Area during the operational phase Year 1, with the growth of new planting predicted to reduce this to a not significant level by Year 15.

5.2.14 The likely significant effects upon visual receptors during the Operational Period Year 1 are set out below with effects upon these receptors assessed as being not significant by Year 15, following the growth of tree and shrub planting implemented as part of the outline landscape strategy.

North-west of York Area:

- Cyclists on National Cycle Route 65 on Overton Road; and
- People in vehicles on Overton Road.

Monk Fryston Substation Area:

- Residents of Pollums House Farm;
- People in vehicles on the A63; and
- People in vehicles on Rawfield Lane.

5.2.15 The likely significant effects upon visual receptors that would be experienced for the full length of the Operational Period, including Year 15, are set out below:

North-west of York Area:

- Receptors at Woodstock Lodge wedding venue;
- Residents of Overton Grange and Nos. 1 and 2 Glenroyd Cottages;
- Residents of New Farm;
- Users of the ORPA west of Newlands Farm;
- Users of PRoW network east of Shipton-by-Beningbrough; and
- People in vehicles on the A19 between Skelton and Shipton-by-Beningbrough.

Next steps

- 5.2.16 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Any updates to the desk study/field survey etc along with further engagement and consultation with consultees including landscape and planning officers of the Local Authorities that cover the study area will be incorporated into the ES.
- 5.2.17 At the invitation of the National Trust, a field survey at Beningbrough Hall will be arranged to establish the baseline visibility towards Yorkshire GREEN from the upper floors of the hall.
- 5.2.18 Subject to permission being given by residents, a more detailed field survey from individual residential receptors on private land is planned, where the preliminary assessment indicates the potential for significant effects.
- 5.2.19 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.3 Historic environment

- 5.3.1 This chapter summarises the assessment findings at this point in the EIA process for the Historic Environment, based on Chapter 7 of the PEIR.

How effects on the Historic Environment have been assessed

- 5.3.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN on the Historic Environment, which includes archaeological remains, historic buildings and historic landscapes. Potential effects which have been assessed include direct effects (for example, the loss of archaeological remains through construction) and indirect effects (for example, change in the setting of a heritage feature) on designated heritage assets (including Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, Conservation Areas, and Battlefields), non-designated heritage assets (including locally important buildings and structures), and historic landscape character. The preliminary assessment has considered the area within the draft Order Limits (the boundary of Yorkshire GREEN) where there could be direct impacts from new infrastructure including new substations, CSECs, and new overhead lines and pylons.
- 5.3.3 In addition, heritage assets within an Extended Study Area, specific for the Historic Environment assessment, around Yorkshire GREEN were assessed for indirect effects arising through change to setting caused by the construction and operation of Yorkshire GREEN.
- 5.3.4 Information on the existing Historic Environment was based on the results of a site walkover and a desk study, which involved the collation of data from a range of sources including the National Heritage List for England (NHLE), City of York Historic Environment Record (HER), North Yorkshire HER, West Yorkshire HER, historic mapping, and remote sensing data and imagery such as LiDAR (a method in which a 3D representation of the earth's surface is generated using an airborne laser). The requirements of national and local planning policy and professional guidance were also considered in the assessment.

5.3.5 In addition, to understand the existing Historic Environment and associated potential issues, engagement has taken place with Historic England, the National Trust, and the local authorities for City of York, North Yorkshire, Harrogate, Leeds, and Selby. These consultations helped define the key considerations for assessing potential significant effects on heritage assets.

Baseline environment

5.3.6 The PEIR Study Area within the Vale of York comprises low-lying land consisting mainly of arable agricultural fields, through which the River Ouse and its tributaries flow. Market towns, villages and hamlets punctuate the rural landscape, many of which lie on the outskirts of the City of York. The Vale of York has been intensively settled and farmed since the prehistoric period. Settlement patterns in place by the medieval period comprise planned nucleated villages surrounded by open field agriculture. Many of these settlements have survived into the present day, surrounded now by agricultural land developed in the post-medieval and modern periods, and 18th and 19th century farmsteads.

5.3.7 The south of the PEIR Study Area lies along the eastern edge of the southern magnesian limestone ridge, roughly between Tadcaster and the River Wharfe in the north, to Monk Fryston in the south with terrain comprising low rolling hills cut through by shallow valleys. Land use remains largely arable agriculture, with isolated farms present within the Study Area itself. Much of the south section was intensively settled and farmed from the prehistoric period onwards, although there is less evidence for medieval settlement and agriculture in this area compared with the Vale of York.

5.3.8 The PEIR Study Area contains three scheduled monuments, two of which are medieval moated sites, at Nether Poppleton and Red House, with the third being a medieval manorial complex at Lead. The PEIR Study Area includes five conservation areas, at Osbaldwick, Murton, Skelton, Nether Poppleton and Upper Poppleton. There are a total of 76 listed buildings within the PEIR Study Area, including the Grade I listed Church of St Giles, Skelton, and Grade II* listed St Mary's Chapel, Lead. Two registered battlefields are located within the PEIR Study Area, at Marston Moor and Towton. There are no World Heritage Sites within the PEIR Study Area.

5.3.9 Within the Extended Study Area are a further 15 scheduled monuments; 261 listed buildings; seven conservation areas; and two registered parks and gardens (Grade II listed Beningbrough Hall and Grade II* listed Ledston Hall).

5.3.10 There are also numerous non-designated heritage assets in the PEIR Study Area which represent the long history of settlement and land use ranging from the Mesolithic period to the present day. These include small find locations, elements of prehistoric and historic landscapes such as farmsteads and field systems, historic buildings, and industrial sites such as quarries.

Embedded environmental measures

5.3.11 A range of environmental measures which relate to the Historic Environment are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- Avoiding sensitive sites such as scheduled monuments and listed buildings through amending Yorkshire GREEN footprint where practical.

- Locating Project infrastructure such as pylons and substations, to avoid, maximise separation from or exploit existing screening in views from sensitive heritage assets such as listed buildings and scheduled monuments.
- Minimising the development footprint and construction areas as far as is practicable.
- Including screening which could include bunding with planting around the new substations to minimise the effect on the setting of heritage assets.
- In line with good practice, mitigation plans will be developed to detail how sensitive heritage assets will be protected during construction and operation.

Likely significant effects

- 5.3.12 There is a potential for significant effects on certain heritage assets when Yorkshire GREEN is being constructed and from its permanent presence once operational. During the construction phase these include the potential impact, in certain locations, on archaeological remains, changes to the setting of heritage assets and change to historic landscape character.
- 5.3.13 There is a potential for significant effects through the potential disturbance of buried archaeological remains during the construction of substations at Overton and Monk Fryston. In the case of Overton, cropmarks of probable prehistoric features are recorded in the vicinity of the area where the substation would be built, and it is likely these extend into the draft Order Limits (Yorkshire GREEN boundary). Further survey work comprising geophysical survey in the first instance will be undertaken to inform scheme design and allow appropriate mitigation measures to be agreed with the relevant local authority. It is assessed that this mitigation will reduce the effect to non-significant.
- 5.3.14 Intrusive groundworks, such as those associated with the construction of Substations at Overton and Monk Fryston have the potential, in a worst case, to give rise to significant adverse effects on archaeological remains in the absence of mitigation. This is particularly where works are required in sensitive locations including the Marston Moor Registered Battlefield and near Towton Registered Battlefield, or where non-intrusive alternative working methods cannot be employed, such as at the CSEC sites or at new overhead line towers. This potential is recognised, and where possible the scope of intrusive works has been minimised by the use of techniques such as using existing access tracks and trackway (interlocking panels which avoid the need to disturb the ground) for working areas, minimising the potential for these effects. Any disturbance in archaeologically sensitive areas would be subject to a scheme of archaeological investigation and it is assessed that this mitigation will reduce the effect from significant to non-significant.
- 5.3.15 There is also potential for a significant adverse effect during the construction and operational phase on the setting of the Grade I listed Beningbrough Hall in views of and towards Overton Substation and the new overhead line. Preliminary survey found there to be very little visibility towards Yorkshire GREEN at ground level which was not anticipated to give rise to a significant effect, but further detailed survey will be undertaken, such as assessment from the upper floors of the Hall, in consultation with the prescribed consultees and National Trust to confirm this preliminary assessment.

Next steps

- 5.3.16 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire

GREEN design will continue in response to feedback from consultation. Any updates to the desk study will be incorporated into the ES. These include a review of data searches where appropriate and the inclusion of further data such as the Vale of York National Mapping Programme (NMP), and field survey including the results of geophysical survey at the proposed sites of Overton substation and Monk Fryston Substation, along with further engagement and consultation with consultees at Historic England and North Yorkshire LPA. In addition, further assessment of the setting of Beningbrough Hall will take place, as is detailed above.

- 5.3.17 The ES chapter will also include an assessment of the potential cumulative effect of Yorkshire GREEN with ‘other developments’ as well as an assessment of inter-related effects.

5.4 Biodiversity

- 5.4.1 This chapter summarises the assessment findings at this point in the EIA process for Biodiversity, based on **Chapter 8** of the PEIR.

How effects on Biodiversity have been assessed

- 5.4.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN on ecological features (designated wildlife sites, habitats and species) within the area that Yorkshire GREEN could affect. This area, known as the Zone of Influence (Zol), differs depending on the type of ecological feature considered and the nature of the potential environmental change that may arise from Yorkshire GREEN.
- 5.4.3 The assessment methodology used for Biodiversity has been aligned with the standard industry guidance provided by the Chartered Institute of Ecology and Environmental Management.
- 5.4.4 Information on the existing Biodiversity features has come from a variety of sources including historical records of flora and fauna, descriptions of wildlife sites gained through desk study, and ongoing field surveys.
- 5.4.5 Technical engagement with consultees in relation to Biodiversity is ongoing. To date discussions have been held with Natural England regarding the general bird survey approach and the possible use of District Level Licensing (DLL) to address potential effects on great crested newts. The approach to feature-specific baseline surveys, mitigation/ compensation design, ecological assessment, and the scope of Habitats Regulation Assessment (HRA) will be discussed and agreed with relevant stakeholders.

Baseline environment

- 5.4.6 Surveys to establish habitat type and potential importance for nature conservation, known as ‘Phase 1 habitat surveys’ are in progress, with approximately 66% of land within the draft Order Limits (the Project boundary) and 50m buffer around these having been surveyed to date. The dominant habitat type throughout the draft Order Limits and 50m buffer is arable. Additional habitats recorded include woodland, grassland, hedgerows, standing water (ponds/wet ditches), running water (rivers, streams and ditches), dry ditches, scrub, and ephemeral/short perennial vegetation.
- 5.4.7 Within the relevant Zols the following international/national designated sites are present: one Ramsar Site, one Special Protection Area (SPA) and nine Sites of Special Scientific Interest (SSSIs). None of these are located within the draft Order Limits. There are also 50 non-statutory biodiversity sites of importance at the county level within 2km of the

draft Order Limits. Of these, three sites are located fully or partially within the draft Order Limits, with a further five sites within ~100m. A further 28 deleted sites (which are still likely to be of higher ecological quality than other land in the area) have also been identified, of which three are located fully or partially within the draft Order Limits. Three Yorkshire Wildlife Trust (YWT) reserves and one RSPB reserve have also been identified within the area of search, but outside the draft Order Limits.

- 5.4.8 Badger surveys have been undertaken in conjunction with baseline habitat surveys and have recorded the presence of active setts (and other evidence) within the draft Order Limits. Winter bird surveys undertaken in February and March 2021 have recorded the presence of a number of target species and further surveys will be undertaken during the period October 2021 to March 2022. Additional species-specific surveys will be undertaken as required to inform the Biodiversity assessment including for bats, reptiles, otter and water vole. The requirement for great crested newt surveys is dependent on the outcome of ongoing discussions with Natural England regarding the DLL scheme.

Embedded environmental measures

- 5.4.9 A range of environmental measures which relate to Biodiversity are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Standard best practice environmental measures would be employed such as timing the removal of vegetation to avoid the bird breeding season where practicable, the adoption of pollution prevention and dust control techniques, and measures to avoid the spread of invasive species such as Japanese knotweed. Good practice measures would be detailed in a Construction Environmental Management Plan (CEMP).
- 5.4.10 Examples of additional measures include the following:
- Detailed design and micro-siting within the Limits of Deviation for the Project (i.e. moving Project infrastructure by very small distances) would minimise land take and seek to avoid the more important habitat and species features, and sensitive sites.
 - Habitat connectivity (the links between different areas of habitat) would be retained wherever possible by maintaining links within and to green corridors such as hedgerows and watercourses.
 - Areas of temporary habitat loss would be reinstated and replanted, wherever practicable, following the completion of construction in each area.
 - Where tree loss is required to achieve electrical safety clearances, pollarding or coppicing (where regrowth would occur within a season) would be used to avoid total loss of habitat where possible.
 - The design of all temporary and permanent lighting would be informed by the joint guidance provided by the Bat Conservation Trust and Institution of Lighting Professionals.
 - Where applicable European Protected Species licences would be secured, which would include strict measures and procedures to ensure that effects on European protected species are minimised.

- Biodiversity Net Gain (BNG)⁴ equivalent to a 10% uplift above the current baseline situation will be built into Yorkshire GREEN through the design process⁵.

Likely significant effects

- 5.4.11 Based on the proposed location of substations, CSECs and pylons and routing of the new and modified overhead lines, plus the incorporation of appropriate embedded environmental measures, no Significant Effects have been identified at this stage on Biodiversity from construction, operation and maintenance, and decommissioning.

Next steps

- 5.4.12 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Results from ongoing field surveys including the baseline extended Phase 1 habitat survey and targeted protected species surveys, along with further engagement and consultation with Natural England, the Environment Agency and Local Authorities will be incorporated into the ES.
- 5.4.13 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.5 Hydrology

- 5.5.1 This chapter summarises the assessment findings at this point in the EIA process for Hydrology and Flood Risk, based on Chapter 9 of the PEIR.

How effects on hydrology and flood risk have been assessed

- 5.5.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN on hydrology, including the aquatic environment, surface water resources and flood risk. The effects to water quality, river flows, physical changes to rivers, lakes and other water features have been considered. This approach has enabled a Water Framework Directive (WFD) assessment to be integrated into the ES. The assessment is accompanied by a preliminary Flood Risk Assessment (FRA).
- 5.5.3 The Hydrological Study Area (HSA) includes all the WFD waterbody catchments intersected by the draft Order Limits for Yorkshire GREEN. The HSA is then extended to the boundary of any contiguous WFD water bodies in recognition of the WFD being the most overarching applicable regulatory framework for these studies (management and monitoring of the hydrological environment is most commonly assessed at a waterbody scale).
- 5.5.4 Information on the existing hydrology is based on a site walkover and a desk study, which involved the collation of data from a range of sources including the Environment Agency, Lead Local Flood Authorities (LLFA) and local district councils.
- 5.5.5 In addition, in order to understand the existing hydrology and flood risk environment, and associated potential issues, engagement has taken place with the Environment

⁴ BNG is a concept that can be simply defined as providing more biodiversity than that which is lost through development.

⁵ Compensation and enhancements to biodiversity to be delivered as Biodiversity Net Gain have been integrated within the project evolution to enable consideration through the design process and within stakeholder engagement. However, the proposed delivery of compensation and BNG has not been used to influence the assessment of significance as these are applied following the identification of residual effects.

Agency, North Yorkshire County Council as a LLFA and the York Consortium Drainage Boards.

Baseline environment

- 5.5.6 The draft Order Limits for Yorkshire GREEN could potentially affect the River Ouse, River Nidd, River Wharfe and Cock Beck, all of which are designated Environment Agency Main Rivers⁶. In addition, several tributaries and drainage ditches also interact with Yorkshire GREEN, which largely fall within the Main River catchments and are tributaries of the River Ouse. Specifically, Hurns Gutter, White Sike, Stream Dyke and Mill Dyke and associated flood zones may interact with Yorkshire GREEN.
- 5.5.7 These rivers, streams and ditches could be affected by Yorkshire GREEN, particularly during the construction phase. Changes in flow or water level, water quality, the form of the channel and/or the volume of sediment in the water could in turn affect the aquatic environment dependent on these waterbodies, the water resources that are drawn from them, and the risk of flooding posed to people, property and infrastructure, on-site and elsewhere.
- 5.5.8 The Humber River Basin Management Plan sets out the ‘status’ of rivers, lakes and groundwater bodies, according to the requirements of the Water Framework Directive. ‘Status’ is based on the quality of the water body, which includes physical, chemical and biological characteristics, and ranges from Bad to High. There are 14 WFD water bodies in the Hydrological Study Area.
- 5.5.9 Within the vicinity of Yorkshire GREEN there are a variety of sources of flood risk, including from rivers (including the Rivers Ouse, Wharfe, Cock Beck and the Hurns Gutter) and their tributaries), and surface water.
- 5.5.10 Five water dependent conservation sites have been identified as potentially hydrologically connected to Yorkshire GREEN. These are Clifton Ings and Rawcliffe Meadows Site of Scientific Interest (SSSI), Sherburn Willows SSSI and Yorkshire Wildlife Trust Site (YWT), Overton Borrow Pits Site of Importance for Nature Conservation (SINC), Healaugh Marsh SINC and the River Ouse Local Wildlife Site (LWS) and candidate SINC.
- 5.5.11 The draft Order Limits intersect the Ouse from the River Nidd to Stillingfleet Beck, Drinking Water Protected Area, and the Humber (SWSGZ6007) Acomb Landing and Moor Monkton Drinking Water Safeguard Zone. Both designations are associated with surface water abstractions. Only one surface water abstraction, used for agricultural spray irrigation, has been identified as having the potential to be affected by Yorkshire GREEN.
- 5.5.12 The baseline conditions may be influenced in the future by changes to the climate and land use, and by improvements to land and water quality as a result of legislation, policy and other drivers.

Embedded environmental measures

- 5.5.13 A range of environmental measures which relate to hydrology and flood risk are embedded as part of the Yorkshire GREEN design to remove or reduce significant

⁶ Main rivers are usually larger rivers and streams. They are designated as such and shown on the Main River Map. The Environment Agency carries out maintenance, improvement and construction work on main rivers to manage flood risk.

environmental effects as far as possible. Examples of these measures include the following:

- adherence to Pollution Prevention Guidance Notes (PPGs) and Guidance for Pollution Prevention Notes (GPPs)⁷ to avoid pollution generation;
- measures to control the rate and quality of runoff water, such as choice of hardstanding material (permeable to allow water to infiltrate into the ground below) and use of interceptor drains and soakaway ditches where necessary;
- locating soil stockpiles well away from watercourses and where this is not possible, installing silt fences to capture sediment-laden water running-off the site;
- for watercourse crossings (for construction traffic), designs (including construction methods) that minimise disturbance of channel bed and banks would be used;
- the temporary crossings over the Cock Beck would be clear span (span the entire watercourse from bank top to bank top (the bridge heights would be well above the predicted floodwater level); and
- in the floodplain, measures would be incorporated to minimise obstruction or deviation of waters in the event of a flood, including leaving gaps in soil stockpiles, minimising the elevation of any raised structures (e.g. access routes and working areas), and, at specific locations, ensuring that access routes and working areas would be 'at grade' (i.e. at the same level as the existing land surface) and stockpiles are located outside of the floodplain.

Likely significant effects

5.5.14 Potential effects on the water environment could include the following.

- Changes in water quality from high volumes of sediment (sediment-laden runoff) from areas where the ground has been disturbed during construction works entering nearby watercourses, or the accidental release of pollutants, for example from spillages, as a result of construction works.
- Changes in flow regime, or inputs of sediments-laden water arising from site drainage/excavation dewatering works (the pumping of groundwater out of excavations to ensure dry working is possible) and/or works in or near watercourses (e.g. installation of bridges or culverts).
- Changes to the flow in watercourses as a result of the watercourse crossings.
- Increases in run-off rates and volumes (the speed and volume of rainfall that 'runs off' as surface water) as a result of changes in land cover type (for example removing vegetation that covers the ground and exposing bare earth) and/or changes in ground elevations to create temporary access routes.
- Changes in the capacity of the floodplain to store and convey floodwater as a result of the creation of temporary raised structures in the floodplain, such as temporary embankments for the larger watercourse crossings, access routes and/or topsoil stockpiles.

⁷ Both PPGs and GPPs are maintained by NetRegs and provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales only. For businesses in England, regulatory guidance is available from GOV.UK instead.

5.5.15 Based on the proposed location of substations, CSECs and pylons and routing of the new and modified overhead lines, plus the incorporation of appropriate embedded environmental measures, no Significant Effects have been identified at this stage on hydrology and flood risk from construction, operation and maintenance, and decommissioning.

Next steps

- 5.5.16 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Any updates to the desk study/field survey etc along with further engagement and consultation with consultees (including the Environment Agency, LLFAs and the internal drainage boards) will be incorporated into the ES. Hydraulic flood modelling is to be undertaken to ensure the Overton Substation, which is identified to be at risk of flooding in the future due to climate change, is resilient to flooding and the ES will identify any flood resilience measures required.
- 5.5.17 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.6 Geology and hydrogeology

5.6.1 This chapter summarises the assessment findings at this point in the EIA process for Geology and Hydrogeology, based on **Chapter 10** of the PEIR

How effects on geology and hydrogeology have been assessed

- 5.6.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN with respect to Geology and Hydrogeology, including groundwater, land contamination and ground instability receptors (for example human health and buildings). This assessment is based on risk assessments that consider whether the construction, operation or decommissioning of Yorkshire GREEN could disturb areas of old contaminated ground, introduce new soil contamination, cause contamination to enter groundwater, cause gas to move out of the ground that may build up in buildings, or destabilise the ground.
- 5.6.3 The preliminary assessment has considered the geographical area in which there could be impacts from new infrastructure or the removal / modification of existing infrastructure, with particular focus on areas where the construction work will involve notable disturbance of the ground (for example, new substations, new pylons and new underground cables). The preliminary assessment considers effects both within the draft Order Limits (the Project boundary) and in the surrounding area (for example, nearby drinking water abstraction boreholes).
- 5.6.4 Information on previous land uses has been obtained from historical mapping. Information on geological conditions and aquifer classifications has been obtained from maps and other data sets provided by the British Geological Survey (in electronic format). Hydrogeological records, including information on permitted groundwater abstractions, have been obtained from the Environment Agency, who have also provided records of previously recorded pollution incidents. Details of private groundwater abstractions have been provided by Local Planning Authorities, if these are held. UK government 'open source' electronic databases (freely available online) have

been used to identify the locations of historical landfills, authorised landfills, and groundwater Source Protection Zones (SPZ). Finally, an environmental data search has been undertaken, which gives information on a range of matters (such as fuel station locations, registered waste treatment sites and sites that are permitted under hazardous substances regulations). These extensive desk-based records have been supplemented by physical inspections in parts of the Draft Order Limits, where necessary to support the assessment.

- 5.6.5 In order to understand the existing geological and hydrogeological environment and associated potential issues, careful consideration has been given to comments provided by regulators and other consultees provided within the EIA Scoping Opinion.

Baseline environment

- 5.6.6 The baseline environment has been considered for a Study Area of up to 250m from the draft Order Limits as standard, extended to 500m for hydrogeological data due to the mobile nature of groundwater.
- 5.6.7 The solid geology can be split into two broad areas; to the north of a point around 2.3km north of Tadcaster town centre it consists of deposits of the Sherwood Sandstone Formation, whereas to the south of this point it consists mainly of limestone and dolostone (a magnesium rich limestone). In some places, such as to the west of Tadcaster, this solid geology occurs very near to the surface. However, in most parts of the draft Order Limits the solid rocks are beneath more recent 'superficial' deposits. These vary in their composition, but of particular note are deposits of clay and silt at and around the proposed Overton Substation site, and deposits of glacial till (mixed material deposited by a glacier, mostly consisting of clay) at the proposed Monk Fryston Substation site.
- 5.6.8 The sandstones, limestones and dolomites that underlie the Study Area contain large amounts of groundwater, so are classified by the Environment Agency as Principal Aquifers. This groundwater is generally deep below the ground surface, for example around Tadcaster it lies around 40m below the ground surface. Groundwater is pumped from these aquifers for a variety of purposes, and as a result parts of the draft Order Limits fall within 'Source Protection Zones' (SPZ) defined by the Environment Agency. Work within SPZs must be planned and carried out carefully, so as not to cause pollution of groundwater.
- 5.6.9 The historical land use throughout the Study Area appears, overwhelmingly, to have been agricultural. There is a low risk that old soil contamination will be present on such land. In a small number of locations, non-agricultural land use is recorded, mostly associated with the quarrying of limestone or sand and gravel. There is a greater possibility of soil contamination in such locations (for example, from materials that were used in the past to fill in old quarries after they closed), although no particularly high risk previous uses (for example gas works, sewage works or recorded landfills) have been identified in locations where the construction or operation of Yorkshire GREEN may involve ground disturbance.
- 5.6.10 Large sections of the Study Area are underlain by soluble rocks (limestone and dolostone). The general topography of the Study Area is relatively flat. As a result, the vast majority of the Study Area is classified by the British Geological Survey (BGS) as being in a situation in which slope stability problems are "not likely" (the lowest possible risk category that the BGS assigns).

- 5.6.11 There are no designated protected geological conservation sites within possible influencing distance of the draft Order Limits.
- 5.6.12 The south of the draft Order Limits falls within the Yorkshire Coalfield. However, the Coal Authority advises that the EIA does not need to consider coal mining legacy issues, due to the depth of the coal and the absence of any recorded old mine entries.

Embedded environmental measures

- 5.6.13 A range of environmental measures which relate to the geology and hydrogeology assessment are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures that relate to geology and hydrogeology include the following.
- Characterisation of ground that might contain soil contamination by testing in advance, with the results informing health & safety procedures and environmental controls (for example dust suppression) during construction.
 - Formalised 'stop' procedures for any unexpected potentially contaminated ground conditions found during construction, to prevent the unknowing release of contamination.
 - Dust suppression during the disturbance of soils, and sheeting of stockpiled soils (if these contain contamination) to prevent airborne contaminants being blown into the surrounding area.
 - Best practice in the storage, handling and use of fuels and other chemicals. Examples include storing fuels in correctly contained areas, running liquid wastes through oil-water separators to collect the oil for off-site disposal, and the use of drip trays and other measures to prevent construction plant leaking small amounts of fuel onto the ground.
 - Restrictions on activities within the more sensitive parts of SPZs (referred to as Zones 1 and 2), such as prohibiting / minimising vehicle parking, de-icer storage, rock salt storage and the wash-out of ready-mix concrete vehicles.
 - Use of rock salt to be limited to that necessary, and to be within the recommended maximums of industry guidance.
 - Piled foundations (if required) to be designed to be installed by techniques that do not present a risk of causing contamination to enter aquifers. This can be achieved by following standard design guidance, informed by ground investigation data, as part of the detailed structural design of any new infrastructure that requires piled foundations.

Likely significant effects

- 5.6.14 Based on the proposed locations of substations, CSECs and pylons and routing of the new and modified overhead lines, plus the incorporation of appropriate embedded environmental measures, no Significant Effects have been identified at this stage in relation to geology and hydrogeology from construction, operation and maintenance, and decommissioning.
- 5.6.15 This is because the groundwater in the sensitive aquifers (including the SPZ) is generally deep so would not be affected directly by near surface construction activities. Indirect effects, such as contamination moving down through the ground into these aquifers, would be prevented by the embedded measures, and in many cases the

natural ground conditions would also protect against this (where the superficial deposits provide a barrier between the surface and the aquifers).

- 5.6.16 Human health risks from exposure to soil contamination are low because much of the land appears to have only ever been agricultural, and because where this is not the case the embedded measures will still prevent significant risks / adverse effects. The presence of soluble rocks in the draft Order Limits is a standard engineering design consideration, and the use of normal engineering and drainage design processes will prevent any ground instability risks. Likewise, in the small areas where there is some potential for land instability, standard engineering design (as necessary to prevent damage to the new structures) would ensure no significant environmental effects.

Next steps

- 5.6.17 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Any updates to the baseline data (for example, further targeted walkover inspections, which may be undertaken subject to land access) along with further engagement and consultation with consultees (if required, subject to feedback on the Preliminary Environmental Information Report) will be incorporated into the ES.
- 5.6.18 The ES will include consideration of any precautionary groundwater monitoring procedures that should be implemented during construction to verify environmental compliance.
- 5.6.19 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.7 Agriculture and soils

- 5.7.1 This chapter summarises the assessment findings at this point in the EIA process for Agriculture and Soils, based on Chapter 11 of the PEIR.

How effects on agriculture and soils have been assessed

- 5.7.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN on agricultural land (in terms land quality and loss of land for agricultural use); and soil resources (in terms of damage and loss) both when Yorkshire GREEN is being constructed and permanent effects once it is in the operational stage. When assessing loss of agricultural land, the assessment has made a distinction between temporary loss (during construction works) and permanent loss (either through the development of built infrastructure or a permanent change in land use).
- 5.7.3 The preliminary assessment has considered the geographical area within the draft Order Limits (the Project boundary), as this describes the full extent of Yorkshire GREEN. No buffer was applied to the draft Order Limits as impacts to soils and agricultural land only occur on land that would be directly impacted by Yorkshire GREEN.
- 5.7.4 Information on the agricultural and soils baseline is based on a desk study, which involved the collation of data from a range of sources including soil association data and mapping from the Soil Survey of England and Wales; soil erodibility and agroclimatic

data published by Cranfield University; and Agricultural Land Classification (ALC) data and mapping at various scales provided by MAFF and Defra and Natural England.

- 5.7.5 Best and Most Versatile (BMV) agricultural land is classed as ALC Grades 1, 2 and Subgrade 3a (excellent, very good and good quality); the identification of BMV land is important to the assessment of impacts to agricultural land. Limited areas within the draft Order Limits are covered by detailed survey data which provide a subdivision of Grade 3 land into Subgrade 3a (BMV) and Subgrade 3b (non-BMV); however, the ALC data covering the majority of the draft Order Limits, known as the Provisional ALC data, does not provide this distinction. Therefore, where detailed data are not available, the amount of BMV land has been determined using the areas of Grade 1 and 2 as described on the Provisional ALC mapping, with the subdivision of land mapped as Grade 3 calculated using Natural England's Likelihood of BMV Agricultural Land data.
- 5.7.6 In order to understand the existing soil and agricultural environment and associated potential issues, careful consideration has been given to comments provided by regulators and other consultees provided within the EIA Scoping Opinion.

Baseline environment

- 5.7.7 The land within the draft Order Limits comprises Grade 1, 2, 3 and 4 agricultural land, as well as non-agricultural and urban land classifications. A very small area of Grade 1 land was identified in a detailed survey conducted near Bramham. Grade 2 agricultural land is located along the majority of the southern part of the draft Order Limits from Long Marston to Monk Fryston; whereas Grade 3 agricultural land is primarily identified to the north from Long Marston to Shipton, and to the east of York around Osbaldwick Substation. A corridor of Grade 3 agricultural land is also identified to the north of Tadcaster, broadly following the route of the River Wharfe. The division of Grade 3 land was calculated as 53% Subgrade 3a to 47% Subgrade 3b. Small distinct areas of Grade 4 and non-agricultural land are found throughout the draft Order Limits.
- 5.7.8 In total, 713.8ha (72.2%) of the agricultural land within the draft Order Limits is calculated to be of Best and Most Versatile quality; and 258.8ha (36.3%) is calculated to be of non-Best and Most Versatile quality. The remaining land is considered to be under non-agricultural land uses. Therefore, it is considered that Yorkshire GREEN would likely impact Best and Most Versatile agricultural land.
- 5.7.9 The risk of erosion (the sensitivity of soils to development) varies by soil type. Eleven distinct soil associations are mapped within the draft Order Limits with the majority of variation in soil types identified between Tadcaster and Moor Monkton, where nine associations are mapped. However, the land within the draft Order Limits is dominated by two soil associations; the Foggathorpe 2 association (41.6%) which is situated to the north and the Aberford association (35.3%) which is situated to the south; these soils are at very small and small risk of erosion, respectively. Overall, the majority of soils (five of the 11 mapped associations, approximately 88% of soil cover within the draft Order Limits) are at very small or small risk of erosion; and approximately 11% of soils (four of the mapped associations) are at moderate risk of erosion and are located between Long Marston and Tadcaster. Two soil associations are classed as being at high or very high risk of erosion, but account for only a very small proportion of soils present. These are located in discrete areas near to Osbaldwick Substation and bordering an access road east of Shipton.
- 5.7.10 The majority of agricultural land has been identified to be in arable production; this finding corroborates the ALC data, as higher quality (BMV) agricultural land is more productive and better suited to arable use than land of lower quality. The arable land is

interspersed with permanent pasture and some small to medium woodlands and plantations.

Embedded environmental measures

- 5.7.11 A range of environmental measures which relate to Agriculture and Soils are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following.
- The location of development on non-agricultural land in preference to agricultural land as part of the process to consider different options; and as the Project design develops locating infrastructure on land of lower quality where agricultural land cannot be avoided; where practicable and taking into account technical and other environmental considerations.
 - For areas of temporary development, the reinstatement of agricultural land to the same quality (same ALC grade) or better; and return to agricultural use. Facilitated by the correct management of the supporting soil resources (see below).
 - Adoption of industry standard methods for the handling and storage of soils; based on Defra's current good practice guidelines which describe standard working methods and techniques to protect soil resources.
 - Use of trackway panels (interlocking panels which avoid the need to disturb the ground) rather than stoned roads to access construction areas, where practicable, to minimise the stripping and handling of soil resources.

Likely significant effects

- 5.7.12 Based on the current Project design, plus the incorporation of appropriate embedded environmental measures, no Significant Effects have been identified at this stage in relation to agricultural land and soil resources from construction, operation and maintenance, and decommissioning. This is due to the small area of permanent BMV land take and the measures taken to ensure that soils and agricultural land disturbed by the Project are reinstated to the same quality as prior to the construction of the Project.

Next steps

- 5.7.13 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Should access be available, the desk based assessment of ALC and soils data would be supplemented by a targeted scheme of field survey (to current ALC guidelines) at substations and CSECs (areas of permanent development). The proposed extent of the surveys incorporates all land which could potentially be directly (through placement of built infrastructure) or indirectly (through change of land use for example through the formation of landscaping or creation of a buffer or exclusion zone around the infrastructure) permanently removed from agricultural use. Should access to these sites be refused by landowners and completion of survey work prior to submission of the application for development consent is not possible, the areas of permanent development will be assessed using the desk based methodology.
- 5.7.14 Although the final design presented as part of the application for development consent will provide a robust basis for the final assessment of the impacts of Yorkshire GREEN on soils and agricultural land, it is acknowledged that the precise positioning of works

(for instance new pylon locations) will be subject to LoD and precise placement within these LoD will not be confirmed until the detailed design is produced by the contractor post-consent (should consent be granted). Therefore, it is proposed that, as agreed with Natural England for other linear electricity infrastructure projects, soil surveys for construction soil management planning would be completed post consent when the precise routeing and placement of infrastructure are known, ensuring the surveys are targeted to areas directly impacted by Yorkshire GREEN.

- 5.7.15 Further baseline data will be gained through consultation with Yorkshire GREEN's Lands Team. This information is likely to include site specific data gained from the Project Lands Team's discussions with farmers and landowners which would assist in defining the routeing and micro-siting of infrastructure; and in describing site specific additional mitigation, if required, to ensure that the impact of construction and operation of Yorkshire GREEN on soils and agriculture and agricultural operations are minimised.
- 5.7.16 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.8 Transport

- 5.8.1 This chapter summarises the assessment findings at this point in the EIA process for Transport, based on **Chapter 12: of the PEIR**.

How transport effects have been assessed

- 5.8.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN during construction, operation and decommissioning on transport network users such as pedestrians, cyclists, public transport users and vehicle drivers and passengers.
- 5.8.3 The information used in the PEIR is based on a desk study and site visit which included a review of the overall road network, public transport and accident data from national and local government sources. Due to the COVID-19 pandemic restrictions, it has not been possible to undertake traffic surveys that would be representative of baseline conditions, and so new surveys are proposed to be undertaken in 2021/22 to inform the final assessment, while the use of historic traffic data has been applied to this preliminary assessment. As part of the assessment, transport modelling has been undertaken to understand the effects of traffic generated by Yorkshire GREEN on the road network.
- 5.8.4 The following organisations have also been consulted: North Yorkshire County Council (NYCC), National Highways (NH), Leeds City Council (LCC) and City of York Council (CYC).

Baseline environment

- 5.8.5 The public highway network comprises the strategic road network, which is managed and maintained by National Highways and the local road network, which is managed and maintained by the relevant local highway authorities.
- 5.8.6 Roads within the strategic road network that are proposed to be used to access Yorkshire GREEN include the A1(M), M1 and A64. For the local road network this includes key roads such as A162, A1246, A168, A19, A1078, A59, B1222, B1224 and B1363 and smaller connecting "c" and "U" class roads. Information obtained from the

Department for Transport has identified a number of accidents that have occurred on the highway network surrounding Yorkshire GREEN, however there is not considered to be a significant accident record on the local highways network.

- 5.8.7 Bus services are in operation between major settlements in the area, in addition there are four principal railway lines, one line running between Leeds and York, one between Leeds and Selby, one between York and Harrogate and one between York and Darlington/Middleborough.
- 5.8.8 Yorkshire GREEN potentially affects a number of public rights of way, one of which is the Ebor Way; a National Trail. It will also result in potential effects on two parts of the Sustrans national cycle network (NCN): NCN 65 and 66.
- 5.8.9 Yorkshire GREEN has 34 crossings of the local and strategic highway network. There is also one crossing of the River Wharfe and River Ouse and four crossings of the National Rail network.

Embedded environmental measures

- 5.8.10 A range of environmental measures relating to transport network users are embedded as part of Yorkshire GREEN. Examples include the following:
- Routing of heavy goods vehicles (HGV) during the construction period to avoid Sherburn in Elmet, South Milford, Micklefield, Saxton, Bramham, Clifford, Boston Spa, Center, Healaugh, Tockwith, Long Marston, Rufforth, Askham, Angram, Nether Poppleton, Central York and Haxby and other smaller settlements, where possible.
 - All arrangements of scaffolding of at road crossings will be agreed with the relevant highway authority. Road closures will be avoided where possible.
 - Preparation and implementation of a Construction Traffic Management Plan (CTMP) that will include construction traffic management measures and controls on construction vehicle types, hours of site operation and delivery routes for goods vehicles.
 - Preparation and implementation of a Public Rights of Way Management Plan that includes measures to manage and mitigate effects on the Public Rights of Way network.

Likely significant effects

Overview

- 5.8.11 Based on the proposed location and layout of Yorkshire GREEN at this stage, plus the incorporation of appropriate embedded environmental measures, one significant effect has been identified at this stage from construction traffic at Wighill Lane in Tadcaster. It is considered that this impact could be mitigated to a non-significant effect by ensuring that Heavy Goods Vehicle deliveries are timed to avoid travelling through Tadcaster during school drop-off and pick up times . This would be secured in the CTMP, the implementation of which would be a requirement of the development consent for Yorkshire GREEN.

Cumulative effects

- 5.8.12 No Significant Cumulative Effects are anticipated at this preliminary stage, however, further work considering key local committed developments or highways schemes will

be considered for the cumulative effects assessment and will be included in the ES, as necessary.

Next steps

- 5.8.13 Further work will be undertaken to support the transport assessment that will be presented within the ES. This will include further engagement with relevant stakeholders, and further baseline gathering, including traffic surveys which are to be undertaken following the lifting of UK COVID-19 pandemic restrictions. The results from these surveys will be used to update the understanding of current traffic movements.

5.9 Air quality

- 5.9.1 This chapter summarises the assessment findings at this point in the EIA process for Air Quality, based on Chapter 13 of the PEIR.

How air quality effects have been assessed

- 5.9.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN with respect to air quality on human and ecological receptors during the construction phase. There are no likely significant effects with respect to air quality during the operation phase as due to its nature the Project would not emit substantial amounts of pollutants. There would also be very low numbers of vehicle movements during this phase. The preliminary assessment has considered the geographical area in which significant earthwork and construction activities are anticipated, associated primarily with the new infrastructure (new substations, overhead lines, CSECs etc).
- 5.9.3 Information on the air quality baseline (current) environment is based on a desktop study, which involved the collation of data from a range of sources including Defra and air quality reports published by Hambleton District Council, Selby District Council, City of York Council, Harrogate Borough Council, Wakefield Metropolitan District Council and Leeds City Council.
- 5.9.4 An assessment of dust effects has been completed in accordance with guidance produced by the Institute of Air Quality Management. The assessment considers the potential for dust effects on people during construction. Residential properties within 350m of construction works (draft Order Limits) and within 50m of roads used for construction access up to 500m from the access point to Yorkshire GREEN are identified. The assessment also considered potential dust effects on designated wildlife sites.
- 5.9.5 In order to understand existing air quality and associated potential issues, careful consideration has been given to comments provided by regulators and other consultees provided within the EIA Scoping Opinion.

Baseline environment

- 5.9.6 Existing concentrations of particulate matter (known as PM₁₀), the pollutant of concern in this assessment, are comfortably below the relevant Air Quality Objectives, set out by the Government for the protection of human health. Ambient dust deposition rates are not monitored extensively in the UK and therefore no baseline data with regards to dust are available.

Embedded environmental measures

- 5.9.7 A range of environmental measures which relate to air quality are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures include standard dust management measures, such as covering stockpiles, switching off vehicles when not in use and keeping equipment and vehicles clean, would be included in the Construction Environmental Management Plan (CEMP).

Likely significant effects

- 5.9.8 Based on the proposed locations of substations, CSECs and pylons and routing of the new and modified overhead lines, plus the incorporation of appropriate embedded environmental measures, no Significant Effects have been identified at this stage in relation to air quality and dust effects from construction works on people or designated wildlife sites.

Next steps

- 5.9.9 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Any updates to the baseline data along with engagement and consultation with consultees (if required, subject to feedback on the PEIR) will be incorporated into the ES.
- 5.9.10 The ES will provide further information on and an assessment of Non-Road Mobile Machinery including information on the type, number, location or operational hours of such machinery and likely emissions associated with such machinery.
- 5.9.11 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.10 Noise and vibration

- 5.10.1 This chapter summarises the assessment findings at this point in the EIA process for Noise and Vibration, based on **Chapter 14** of the PEIR.

How noise and vibration effects have been assessed

- 5.10.2 The preliminary assessment has considered likely significant noise and vibration effects during the construction and operation of Yorkshire GREEN on receptors such as people, from the following sources: construction, deconstruction and operation of the construction compounds, the construction works for and the operation of the new and reconfigured overhead lines, the construction works for and the operation of new substations, the construction works for and the operation of CSECs and the associated construction road traffic.
- 5.10.3 The preliminary assessment has considered the geographical area in which there could be impacts from new infrastructure (new substations, overhead lines, CSECs) and changes to existing infrastructure (the reconductoring and realignment of existing overhead lines). The Study Area for each of these noise sources is based on relevant technical guidance (including British Standards) and the area within which noise exposure from Yorkshire GREEN would exceed the level above which adverse effects

on health and quality of life can be detected, in line with Government noise policy. The preliminary assessment considers:

- **residential receptors** (people in their homes including their gardens and shared community open spaces such as parks); and
- **non-residential receptors** (including schools, hospitals, places of worship, commercial buildings and leisure areas).

- 5.10.4 To date, no site surveys have been undertaken due to COVID-19 pandemic restrictions, but they are scheduled to be undertaken to inform the ES. In lieu of a baseline survey, information on the current noise baseline is based on a desk study, involving the collation of data from a range of sources including British Standards relating to noise assessment (BS 5228-1:2009 + A1:2014, BS 5228-2:2009 + A1:2014) and openly available online mapping and data (Google Earth Pro Version 7.3.2.5776, National Grid network route map data, DEFRA magic maps and Extrium England Noise and Air Quality Viewer).
- 5.10.5 To date, no consultation has taken place in regard to noise and vibration. Consultation is planned with the local authorities (Selby District Council, Leeds City Council, City of York, Harrogate Borough Council and Hambleton District Council) to discuss monitoring locations for the collation of baseline noise data, which will be followed up with engagement with respect to the outcomes of the monitoring. Careful consideration has also been given to comments provided by regulators and other consultees provided within the EIA Scoping Opinion.

Baseline environment

- 5.10.6 Land use along the route is predominantly rural and it is anticipated that the baseline ambient noise levels will generally be low except where close to major roads, the East Coast Mainline railway or near to industrial sites.
- 5.10.7 The baseline ambient noise conditions on the outskirts of York (around the proposed Overton Substation) are influenced by road traffic noise from the A19 and A1237, train movements on the East Coast Mainline, with contributions from traffic on local roads and trains on the York – Leeds railway line. Given the area's predominantly agricultural land uses, few other sources of ambient noise are likely to be present.
- 5.10.8 It is proposed that the Poppleton to Monk Fryston overhead line is split into two with two new sections of overhead line connecting into Overton Substation from the south, starting on the outskirts of York city centre. The ambient noise conditions in this area are influenced by a combination of road traffic sources including the A59, the A1237 and the A19 and rail noise from the East Coast Main Line with contributions from the local road network.
- 5.10.9 In the area south-west of Tadcaster where two CSECs are proposed, it is expected that baseline ambient conditions are mostly influenced by road traffic noise from the A1(M) and the A64.
- 5.10.10 Between Overton and Tadcaster, road traffic noise from the A1(M) is likely to be the main contributor to the baseline ambient noise conditions in the area with additional contributions from the A64 and the A59 for the receptors closer to them.
- 5.10.11 Between Tadcaster and the Monk Fryston Substation area, road traffic noise from the A1(M) and M1 motorways is likely to be dominant. For the receptors further east, road traffic noise contributions from the A162 may dominate baseline ambient conditions.

- 5.10.12 Operational noise from existing overhead lines may also contribute to the baseline ambient noise conditions for receptors located in close proximity to them between Overton and Tadcaster, especially during wet or humid conditions.
- 5.10.13 The current baseline noise environment in the vicinity of the new Monk Fryston Substation is likely to be influenced by road traffic noise from the A1(M), A63 and A162, noise related to mineral extraction activities from the quarry on Betteras Hill Road (including heavy vehicles on local roads) and operational noise from the existing Monk Fryston Substation.

Embedded environmental measures

- 5.10.14 A range of environmental measures which relate to noise and vibration are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following.
- In line with good practice, construction machinery would consist of modern machinery fitted with efficient silencers, where possible, designed to minimise noise levels that are generated during operations; all compressors would be ‘sound reduced’ models fitted with properly lined and sealed acoustic covers which are to be kept closed whenever the machines are in use; ancillary pneumatic percussive tools to be fitted with mufflers or suppressers and plant to be properly maintained in accordance with the manufacturers’ instructions to ensure that the occurrence of malfunctions, which can give rise to elevated noise levels, is reduced and any malfunctions that do occur are swiftly repaired.
 - Machines with intermittent use would be shut down in the intervening periods between work or throttled down to a minimum; plant with directional noise characteristics to be positioned to minimise noise at nearby properties and static equipment and machinery to be sited as far as is practicable from inhabited buildings.
 - Locating the proposed Monk Fryston Substation adjacent to the existing substation would minimise the potential for new receptors being exposed to operational noise from transformers and other static plant.
 - Sourcing equipment within Overton and Monk Fryston substations to National Grid technical specifications which include requirements regarding audible noise including confirmation by type testing and sample testing.
 - Locating Project infrastructure such as substations, associated infrastructure, CSECs and new and realigned sections of overhead line away from noise sensitive receptors where possible.
 - The equipment and apparatus within the substations would be mounted onto anti-vibration mountings, meaning the vibration from plant and apparatus within the substation will be very low level.

Likely significant effects

- 5.10.15 An assessment of noise effects from construction road traffic has taken place, which shows a potentially significant effect at receptors within the vicinity of Overton Road (between Stripe Lane and the A19). All other roads assessed as part of the PEIR show a minor adverse effect, which is not likely to be significant.

- 5.10.16 A preliminary assessment of operational noise from new overhead lines has also taken place, which shows a potentially significant effect at receptors within 21m of the new operational 400kV overhead line, however there are no receptors within 21m of the new overhead line. Receptors further than 21m from the new operational 400kV overhead line show an effect which is not likely to be significant.
- 5.10.17 All other assessment work is ongoing, and conclusions cannot yet be drawn as to whether effects from the operation of Yorkshire GREEN or construction activities would be significant. The results of these assessments, along with an updated construction road traffic assessment, will be presented as part of the ES.

Next steps

- 5.10.18 Further information on the current noise environment and conditions will be obtained from a series of noise surveys to be undertaken at locations to be agreed with relevant local authorities.
- 5.10.19 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. Updates to the desk study, results of noise surveys and further assessment will be presented in the ES. Development of the Yorkshire GREEN design will also continue in response to feedback from consultation.
- 5.10.20 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.11 Health and Wellbeing

- 5.11.1 This chapter summarises the assessment findings at this point in the EIA process for Health and Wellbeing, based on **Chapter 15** of the PEIR.

How effects on health and wellbeing have been assessed

- 5.11.2 The preliminary assessment has considered likely effects during construction and operation of Yorkshire GREEN with respect to health and wellbeing, including access to healthcare facilities, access to open space and neighbourhood amenity. The preliminary assessment is based on information obtained to date.
- 5.11.3 The Study Area for the health and wellbeing profile baseline is influenced by the availability of relevant publicly available data which is collected at different scales of administrative geography. The baseline Study Areas includes national (England and Wales), regional (Yorkshire and Humber), County (North Yorkshire County Council), and district level (Harrogate Borough Council (Harrogate), Hambleton District Council (Hambleton), Leeds City Council (Leeds), York City Council (York), and Selby District Council (Selby)) data. In addition, the health and wellbeing baseline includes, where data is available and relevant, profile information from the local wards closest to Yorkshire GREEN.
- 5.11.4 The preliminary assessment considers:
- the health of the construction workforce;
 - the health of local residents living in accommodation or accessing existing health services;

- the health of local residents and, workers and visitors in communities close to the construction sites as well as visitors and those exposed to amenity effects (e.g. noise, construction traffic, air quality and visual intrusion);
- the health of users of affected recreational routes and amenity areas including open spaces and nature, public rights of way, local community services and social infrastructure; and
- the health of local residents, workers from communities close to Yorkshire GREEN as well as visitors exposed to permanent amenity effects (e.g. visual, noise or maintenance traffic).

5.11.5 To date, no consultation has taken place in regard to health and wellbeing. Stakeholder engagement will be carried out as needed during the preparation of the ES. Key stakeholders that will be engaged will include health officials from relevant local authorities and Public Health England. Careful consideration has been given to comments provided by regulators and other consultees provided within the EIA Scoping Opinion.

Baseline environment

5.11.6 Yorkshire GREEN is located in the Yorkshire and Humber region, which has an estimated population of 5,502,967. The Study Area and its immediate surroundings are predominantly farmland, with nearby villages including Tadcaster, Monk Fryston, South Milford, Nether Poppleton, Skelton, Shipton and Wigginton. In addition, Yorkshire GREEN includes works in the east of the city of York, at Osbaldwick substation.

5.11.7 The population within the human health baseline Study Area is shown to be mostly White, and generally less ethnically diverse than England and Wales. In terms of deprivation, areas within the Study Area perform considerably better than the regional average both on deprivation as well as the health deprivation and disability deprivation domain. Leeds however is performing slightly worse than the regional average on all indicators considered. This trend is also seen with life expectancy, and other health and mental health indicators, with Leeds being observed to be the only area within the Study Area to perform worse than the regional and national averages.

5.11.8 There are formal and informal recreational and public open spaces within the Study Area and in proximity of Yorkshire GREEN, and these will provide a health and wellbeing benefit to surrounding communities. With the exception of Leeds, residents in the Study Area have a high propensity to walk for leisure and use local public rights of way.

5.11.9 Within the Study Area, 32 facilities have been identified as healthcare facilities and social infrastructure. The assets comprise of six education facilities (including a campus of York University), five health facilities, six religious facilities, five care homes and ten further community facilities.

Embedded environmental measures

5.11.10 A range of environmental measures which relate to health and wellbeing are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Examples of these measures include best practice such as the development and implementation of a stakeholder communications plan and construction management measures are included in the Construction Environmental Management Plan.

Likely effects

- 5.11.11 The preliminary assessment of Yorkshire GREEN has identified an uncertain health effect as a result of increased employment opportunities during construction, as the assessment of construction workforce was not undertaken. The impact of population change on healthcare services and other social infrastructure could not be identified and the effect is therefore uncertain at this stage. The impact of construction traffic on access to healthcare services and social infrastructure is assessed overall to be neutral.

Next steps

- 5.11.12 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward. In particular, further work in relation to the assessment of noise and vibration and socio-economic effects will provide more information on potential construction and operational effects as their assessment matures. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Any updates to the desk study along with further engagement and consultation will be incorporated into the ES.
- 5.11.13 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

5.12 Socio-economics

- 5.12.1 This chapter summarises the assessment findings at this point in the EIA process for Socio-economics, based on **Chapter 16** of the PEIR.

How socio-economic effects have been assessed

- 5.12.2 The preliminary assessment has considered the likely significant effects of Yorkshire GREEN on tourism and recreational and economic receptors at both the construction and operational stages of Yorkshire GREEN. A Local Study Area containing all land within the draft Order Limits (the Project boundary), plus land within 3km of these in places, has been used to assess the effect of amenity impacts (visual, noise, vibration and air quality) on receptors. A Wider Study Area containing the six host Local Authority areas has been used to assess the economic effects of Yorkshire GREEN.
- 5.12.3 Information on the existing socio-economic baseline is based on a desk study and on the result of baseline survey work on Public Rights of Way undertaken as part of the assessment of traffic and transport effects. The desk study work has involved the collation of data from a range of online data and mapping sources (including Ordnance Survey mapping, Google Earth Pro, magic.defra.gov.uk, the six host local authority websites, nomisweb.co.uk, ons.gov.uk) and for baseline information on the various receptors in the study areas, their own websites (where available).
- 5.12.4 No consultation responses from the EIA Scoping exercise were received on socio-economics and no specific consultation has been undertaken on socio-economics matters to date.

Baseline environment

- 5.12.5 The Local Study Area comprises mainly rural land, with some settlements and transport corridors running through it. There are a range of socio-economic receptors within the Local Study Area including a National Trust property at Beningbrough Hall, a number of

caravan parks, fishing lakes, golf courses, hotels and wedding venues, country parks, nature reserves and Public Rights of Way and other recreational routes. All of these receptors can be considered as sensitive to change as direct or amenity effects could impact on the experience of users.

- 5.12.6 The Wider Study Area covers the six host Local Authority areas, and there are some key differences between the different authorities; Leeds and the City of York being focused on the built up areas of the two respective cities, and the other four authorities being more rural in nature. The economies of the six authorities also show some key differences, with the percentage of economically active people being lowest in Selby (77%) which is similar to the wider Yorkshire and Humber region (77.8%) but lower than the national average for Great Britain of 79%. The other five authorities are all higher than these two averages, with Leeds having the highest proportion at 83.5%. Leeds however has the highest unemployment rate of the six, at 4.2%, similar to both the regional and national figures (4.1% and 4.2% respectively). All of the other five authorities are below these averages, with Harrogate having the lowest rate at 2.2%. Average weekly wages range from £485.50 in Hambleton, to £588.50 in Selby, compared to a regional average of £554.40 and a national average of £587.10.

Embedded environmental measures

- 5.12.7 A range of environmental measures which are relevant to socio-economics are embedded as part of the Yorkshire GREEN design to remove or reduce significant environmental effects as far as possible. Embedded mitigation relating to landscape and visual, historic environment, biodiversity, agriculture and soils, traffic and transport, air quality and noise and vibration effects would also provide mitigation relevant for the socio-economic assessment.

Likely significant effects

- 5.12.8 There is the potential for a number of significant effects from Yorkshire GREEN on socio-economic receptors. During the construction phase these include the potential impact on National Cycle Route 65 and Squires Café and Caravan Park, and at Woodstock Lodge Wedding venue during both the construction and operational phases.

Next steps

- 5.12.9 The preliminary assessment will be refined and where appropriate updated to reflect the final Yorkshire GREEN design to be taken forward and ongoing assessment work in related chapters. In particular, further work in relation to the assessment of noise and vibration will provide more information on potential operational effects as its assessment matures. Development of the Yorkshire GREEN design will continue in response to feedback from consultation. Any updates to the baseline information along with further engagement and consultation with consultees will be incorporated into the ES.
- 5.12.10 The ES chapter will also include an assessment of the potential cumulative effects of Yorkshire GREEN with 'other developments' as well as an assessment of inter-related effects.

6. Looking forward

6.1.1 Following the end of the PEIR Consultation period (09 December 2021), National Grid will consider all comments that have been received.

6.2 What happens next?

6.2.1 National Grid will review all the comments received as part of the consultation process. Where appropriate, these consultation responses will inform further design refinements and proposals for environmental measures to reduce impacts from Yorkshire GREEN.

6.2.2 Based on consultation responses, design refinements and additional information that becomes available from site visits and surveys, the environmental assessment will be reviewed and updated for the final ES. It is expected that the ES to accompany the DCO application will be submitted in winter 2022/2023.

6.3 What if I would like further information?

6.3.1 This document is a non-technical summary of the PEIR for the proposed Yorkshire GREEN project. The full PEIR, which provides more detailed and technical information, is available to view on the following link: nationalgrid.com/yorkshire-green. Further information can also be obtained:

- via email yorkshiregreen@communityrelations.co.uk;
- telephone: 0800 029 4359;
- information will also be publicised on National Grid UK's Twitter and Facebook account, @NationalGridUK

6.3.2 Public consultation events will also take place as follows.

- The Riley-Smith Hall, 28 Westgate, Tadcaster, North Yorkshire LS24 9AB on Monday 1 November 2021 from 3pm to 7:30pm.
- Old Girls' School Community Centre, 18 Kirkgate, Sherburn in Elmet, Leeds, LS25 6BL on Wednesday 3 November 2021 from 3pm to 7:30pm.
- Skelton Village Hall, 1 Brecksfield, Skelton, York, YO30 1YB on Friday 12 November 2021 from 3pm to 7:30pm.
- Monk Fryston and Hillam Community Centre, Old Vicarage Lane, Monk Fryston, Leeds, LS25 5EA on Saturday 13 November 2021 from 12pm to 4:30pm.

6.3.3 Printed copies of the consultation materials, including the PEIR, will be made available at consultation events.

6.3.4 A series of Q&A webinar sessions will also throughout the consultation period, which can be accessed via an online platform. Attendees will be able to type questions to be answered by members of the Project team throughout the session.

6.3.5 These sessions are as follows:

- Saturday 30 October from 12:30pm to 1:30pm

- Monday 8 November from 6pm to 7pm
- Thursday 11 November from 12:30pm to 1:30pm
- Tuesday 16 November from 6pm to 7pm
- Wednesday 24 November from 1pm to 2pm
- Tuesday 30 November from 12pm to 1pm
- Tuesday 7 December from 6pm to 7pm

6.4 How can I have my say?

- 6.4.1 We want to hear your views on the proposals for Yorkshire GREEN. You can get in touch in the following ways.
- Completing the feedback questionnaire online via the Project website: www.nationalgrid.com/uk/yorkshire-green.
 - Providing feedback by email (yorkshiregreen@communityrelations.co.uk) or in writing (FREEPOST YORKSHIRE GREEN CONSULTATION).
 - Completing a hard-copy feedback questionnaire, which can be provided on request requested after receiving a consultation newsletter, at one of the designated public information points, or completed in person at the face-to-face events. The questionnaire can be returned free-of-charge using the Freepost address: FREEPOST YORKSHIRE GREEN CONSULTATION (please write this in capitals, you do not need a stamp).
- 6.4.2 Consultation responses received via any other method than those listed above, such as through social media, will not be formally recorded as part of the consultation.
- 6.4.3 Responses given orally, such as via telephone (0800 029 4359) or via a meeting, will only be considered in exceptional circumstances on a case-by-case basis where someone may not otherwise be able to respond to the consultation.
- 6.4.4 All responses must be received by Thursday 9 December 2021 at 11:59pm. Feedback submissions sent via post will be accepted for up-to five working days after this date.
- 6.4.5 National Grid may be required to make copies of representations available to the Secretary of State. However, National Grid will request that personal details are not placed on the public record. Personal details will be held securely in accordance with the relevant data protection legislation and will be used solely in connection with the consultation process and the development of this Project and will not be disclosed to any third parties.

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