

The Great Grid Upgrade

North Humber to High Marnham

North Humber to High Marnham

Volume 2

Scoping Report Appendices

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nationalgrid

4.A Outline Code of Construction Practice

Contents

| | |
|--|----------|
| 4.A.1 Outline Code of Construction Practice | 1 |
| 4.A.1.1 Introduction | 1 |
| 4.A.1.2 Control and Management Measures | 2 |

4.A.1 Outline Code of Construction Practice

4.A.1.1 Introduction

Overview

4.A.1.1.1 The Project will provide reinforcement to the electricity transmission network between a proposed new substation near Creyke Beck, in Yorkshire and a proposed new substation near High Marnham in Nottinghamshire. The proposed new substations do not form part of the Project. This would be achieved by reinforcing the transmission network with a new 400 kilovolt (kV) electricity transmission line over a distance of approximately 90 kilometres (km).

4.A.1.1.2 The Scoping Boundary is illustrated in **Volume 2, Figure 1.1. Scoping Boundary**. The Project comprises of the following components:

- works to facilitate the connection of a new overhead line (OHL) into a proposed new substation, close to the existing Creyke Beck Substation in the East Riding of Yorkshire;
- a new 400 kV OHL route, approximately 90 km in length between a proposed new substation close to the existing Creyke Beck Substation and a proposed new substation close to the existing High Marnham Substation;
- reconfiguration of a section of the existing 400 kV ZDA¹ OHL to the east of Crowle and west of Keadby Power Station, potentially including cable sealing end compounds (CSEC's), to facilitate the crossing of the new OHL;
- works to facilitate the connection of a new OHL into a proposed new substation close to the existing High Marnham Substation, in Bassetlaw District in Nottinghamshire;
- potential cable sealing end compounds and/or tunnel head houses for any underground cable sections of the Project;
- potential alterations to sections of existing transmission OHLs (such as 4ZQ, 2KN, 4KG, 4TM, ZDA, 4VE, 4VK, and/or 4ZM); and
- potential for removal/reconfiguration/diversion of utility assets.

Purpose of the Code of Construction Practice

4.A.1.1.3 This is the Outline Code of Construction Practice (CoCP) for the Project, which has been produced to support the Environmental Impact Assessment (EIA) Scoping Report. It has been produced to set out control and management measures that will be undertaken during construction of the Project if the DCO is confirmed. The CoCP aims to ensure that adverse effects from the construction phase of the Project, on the environment and the local communities, are minimised and controlled appropriately.

¹ ZDA route running between Drax, Keadby and Thorpe Marsh substations

- 4.A.1.1.4 It will be updated as the Project evolves to include additional measures identified through the engineering design, the EIA process and from engagement with stakeholders. A final CoCP will be submitted as an appendix to the Environmental Statement (ES) as part of the application for development consent. Compliance with the CoCP will be secured by way of a requirement in the Development Consent Order (DCO).
- 4.A.1.1.5 It is assumed that measures in the CoCP will be in place before undertaking the assessment. This will enable the assessment to be proportionate and focused on the likely significant effects that would be material to the decision. This is in accordance with The Institute of Environmental Management and Assessment's (2016) guidance document, Delivering Quality Development.
- 4.A.1.1.6 The Project will be delivered in compliance with all relevant legislation, consents and permits. Any statutory requirements listed in this document and industry good practice guidance which has informed each part of the document are not to be seen as exhaustive.
- 4.A.1.1.7 National Grid will put in place robust procedures to audit and inspect the Project, including its supply chain of contractors, to make sure the control measures set out in the CoCP are adopted when constructing the Project. The CoCP will apply to all areas of the Project delivered pursuant to the DCO, during construction.
- 4.A.1.1.8 Throughout this document, each standard measure has been assigned a reference number, for example (GG01). This is for ease of cross-reference.

4.A.1.2 Control and Management Measures

- 4.A.1.2.1 Control and management measures have been identified that would reduce impacts from the Project on the environment (**Table 4.A.1**). These are generally measures that would normally be implemented on a well-run construction site, but also include a number of good practice measures that have been identified through the scoping work to support a proportionate assessment. They also include measures that have typically been employed on other National Grid projects. The contractor(s) will be expected to demonstrate compliance with these measures during construction.

4.A.1: Control and management measures

| Ref | Control and management measures |
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| | General project commitments |
| GG01 | The project will be run in compliance with all relevant legislation, consents and permits. |
| GG02 | The project design will be compliant with the guidelines and policies relating to electromagnetic fields stated in National Policy Statement EN-5, including the International Commission on Non-Ionizing Radiation Protection guidelines (1998). |
| GG03 | A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Construction Traffic Management Plan (CTMP), and a Site Waste Management Plan (SWMP) will be produced prior to construction. These are collectively referred to as 'the Management Plans'. |
| GG04 | The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake site inspections to check conformance to the Management Plans. |
| GG05 | A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The Environmental Clerk of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerk of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists. |
| GG06 | Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the project. Topics will include but not be limited to: <ul style="list-style-type: none">• pollution prevention and pollution incident response;• dust management and control measures;• location and protection of sensitive environmental sites and features;• adherence to protected environmental areas around sensitive features;• working hours and noise and vibration reduction measures;• working with potentially contaminated materials;• waste management and storage;• flood risk response actions; and• agreed traffic routes, access points, etc. |
| GG07 | A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey. |

| Ref | Control and management measures |
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| GG08 | Land used temporarily will be reinstated where practicable to its pre-construction condition and use. Hedgerows, fences and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, unless otherwise agreed. |
| GG09 | Where sensitive features are to be retained within or immediately adjacent to the Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP. |
| Construction site setup | |
| GG10 | The name and contact details for the Project will be displayed at the entrance to all compounds. This will include an emergency number. |
| GG11 | Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable. |
| GG12 | Appropriate site layout and housekeeping measures will be implemented by the contractor(s) at all construction sites. This will include but not be limited to: preventing pests and vermin control and treating any infestation promptly, including arrangements for the proper storage and disposal of waste produced on site; <ul style="list-style-type: none"> • inspecting and collecting any waste or litter found on site; • locating or designing site offices and welfare facilities to limit the overlooking of residential properties; • locating designated smoking/vaping areas to avoid nuisance to neighbours; • managing staff/vehicles entering or leaving site, especially at the beginning and end of the working day; and • managing potential off-site contractor and visitor parking. |
| GG13 | Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable. |
| GG14 | Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited. |
| GG15 | Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made |

| Ref | Control and management measures |
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| | easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110% of the maximum stored volume. Spill kits will be located nearby. |
| GG16 | Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency). |
| GG17 | Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps. |
| GG18 | Wheel washing facilities will be provided at each main compound, where appropriate. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits. |
| GG19 | Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate. |
| GG20 | Bonfires and the burning of waste material will be prohibited. |
| GG21 | Construction lighting will be of the lowest luminosity necessary to safely perform each task. It will be designed, positioned and directed to reduce the intrusion into adjacent properties, protected species and habitats. |
| GG22 | <p>A Site Waste Management Plan (SWMP) will be developed prior to construction. The SWMP shall include but not be limited to:</p> <ul style="list-style-type: none"> ● waste forecasts; ● identification of recovery routes; and ● actual waste figures once work has begun. |
| | <p>Consideration will be given to the guidance in the Code of Practice developed by Contaminated Land: Applications in Real Environments (CLAIRE) “A Definition of Waste: Development Industry Code of Practice (DoWCoP)”.</p> <p>Dedicated waste management areas will be designed to sufficiently accommodate the types and volumes of waste produced and to reduce the environmental risk of storing waste on site (covered, secured and away from drainage).</p> |
| GG23 | An Emergency Action Plan will be developed for the construction phase which will outline procedures to be implemented in case of unplanned events, including but not limited to site flooding and pollution incidents. |
| GG24 | Where necessary, stone pads will be installed in areas where heavy equipment, such as cranes and piling rigs, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the soil management measures contained in the CEMP. Other soil stabilisation techniques will be considered where appropriate. |

| Ref | Control and management measures |
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| GG25 | <p>Working areas will be appropriately fenced. The type of fencing installed will depend on the area to be fenced and will take into consideration the level of security required in relation to the surrounding land and public access, rural or urban environment and arable or stock farming. For some locations the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas.</p> <p>Fencing will be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified.</p> |
| GG26 | <p>Members of the community and local businesses will be kept informed regularly of the works through active community liaison. This will include notification of noisy activities, heavy traffic periods and start and end dates of key phasing. A contact number will be provided which members of the public can use to raise any concerns or complaints about the project. All construction-related complaints will be logged by the contractor(s) in a complaint register, together with a record of the responses given and actions taken.</p> |
| GG27 | <p>Active private water supplies would be identified with landowners through the landowner discussions. Appropriate measures would be considered during construction. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response would be provided. Where the installation works have affected a private water supply, an alternative water supply would be provided, as appropriate.</p> |
| | <p>Site Restoration</p> |
| GG28 | <p>The construction work area will be reinstated to pre-existing conditions as far as reasonably practical in line with a Soil and Aftercare Management Plan (Requirement 6(1)(a)) and Defra 2009 Code of Construction Practice for the Sustainable Use of Soils on Construction Sites.</p> |
| | <p>Landscape and Visual</p> |
| LV01 | <p>The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid will be used as a replacement, in accordance with the outline vegetation reinstatement plans included within the LEMP.</p> |
| LV02 | <p>The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to design, demolition and construction. This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken or supervised by a suitably qualified arboriculturist.</p> |
| LV03 | <p>A five-year aftercare period will be established for all reinstatement and mitigation planting.</p> |
| LV04 | <p>Construction lighting will be directional and minimised where possible.</p> |

Ecology and biodiversity

- B01 The contractor(s) will comply with relevant protected species legislation. Appropriate licences will be obtained where necessary from Natural England for all works affecting protected species as identified by the Environmental Statement and through pre-construction surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences.
- B02 In the event that vegetation with the potential to support breeding birds is required to be removed during breeding bird season, works will be supervised by an Environmental Clerk of Works. Appropriate protection measures will be put in place should active nests be found. These will include exclusion zones around active nests until chicks fledge or nests become inactive as determined by monitoring by the Environmental Clerk of Works.
- B03 Where there will be a risk of animal entrapment, a means of escape will be installed into all excavations left open overnight.
- B04 To control the spread of invasive weeds in accordance with the Wildlife and Countryside Act 1981, any plant or machinery that has been used in areas infested with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Himalayan balsam, will be thoroughly cleaned. Water used to clean vehicles will be controlled to prevent the spread of the plant (through seeds, rhizomes, fragments, etc.). The area will be cordoned off to prevent any inadvertent spreading.
- B05 All habitats suitable for common reptiles will be subject to two-stage habitat manipulation that will take place between mid-March and mid-October. Firstly, vegetation will be cut to approximately 150mm (with the arisings removed) under the supervision of an Environmental Clerk of Works and the site left for a minimum of two days to allow reptiles to naturally disperse from the area. Secondly, vegetation will be cleared down to ground level under the supervision of an Environmental Clerk of Works. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring reptiles. Construction works could commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula will be timed to avoid the hibernation season (late October to early March). Replacement hibernacula and refugia will be provided.
- B06 Alternative roost structures (bat boxes) will be provided (with landowner consent) on retained trees within the Order Limits or areas outside of the Order Limits agreed with landowners. Three boxes will be provided for each tree with moderate bat roost potential to be felled. Five boxes will be provided for each tree with high bat roost potential to be felled.
- B07 Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.
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| Cultural heritage | |
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| H01 | Locations of known archaeological interest/value, or areas where archaeological work is planned, will be signposted/fenced off to avoid unintentional damage. |
| H02 | Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the project will inform the local planning authority and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the project parameters. |
| H03 | Where practicable, maintain elements within the landscape such as vegetation and hedgerows (including re-instating hedgerow, fences and wells). |
| Water environment | |
| W01 | All works within main rivers or ordinary watercourses will be in accordance with a method approved under environmental permits issued under the Environmental Permitting Regulations or the protective provisions of the DCO for the benefit of the Environment Agency and the Lead Local Flood Authorities. |
| W02 | For open cut watercourse crossings and installation of vehicle crossing points, good practice measures will include but not be limited to, where practicable: <ul style="list-style-type: none"> • reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working; • installation of a pollution boom downstream of open cut works; • the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required; • have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident; • the use of all static plant such as pumps in appropriately sized spill trays; • prevent refuelling of any plant or vehicle within 15 m of a watercourse; • prevent storing of soil stockpiles within 15 m of a main river; • inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and • reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used. |
| W03 | Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Natural substrate will be provided through temporary watercourse crossings box culverts. |
| W04 | Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, |

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| | temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. |
| W05 | The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard to volumes and discharge rates and will include discharges to land, water bodies or third-party drains/sewers. |
| W06 | Where new or additional surfacing is required on any access tracks and compound areas, these will be permeable surfaces where ground conditions allow. The project will incorporate appropriate surface water drainage measures into its final design for the any access tracks so that they do not lead to a significant increase in flood risk. Temporary haul routes within Flood Zone 3 and areas of high and medium risk of flooding from surface water will be removed at the end of the construction phase and the ground surface will be reinstated to pre-project levels. |
| W07 | The contractor(s) will subscribe to the Environment Agency's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The contractor(s) will implement a suitable flood risk action plan, which will include appropriate evacuation procedures should a flood occur or be forecast. |
| W08 | Active private water supplies will be identified with landowners through the landowner discussions. Appropriate measures will be considered during construction. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response will be provided within 24 hours. Where the installation works have affected a private water supply, an alternative water supply will be provided, as appropriate. |
| W09 | In the event of a significant spill during construction, all relevant landowners/tenants will be contacted within 24 hours, within 250 m of the spill, to determine if there are any private water supplies that might be affected; an assessment of the likelihood of groundwater contamination reaching identified private water supplies will be undertaken, and where a private water supply is judged likely to be affected, an alternative water supply will be provided, as appropriate. |
| W10 | Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes. Any effected drainage systems would be reinstated or replaced to ensure their existing function is maintained. |
| Geology and hydrogeology | |
| GH01 | Intrusive ground investigations and assessment will be undertaken prior to construction which will inform appropriate geotechnical design in relation to the site/structure specific ground conditions including, where appropriate, ground instability/adverse ground conditions/ground gas. |
| GH02 | Construction methods such as appropriate piling techniques (if required) to minimise the risk of mixing of aquifer bodies through the creation of new pathways. This includes the provision of a risk assessment, which would be undertaken once the proposed foundation solutions are known, in accordance with EA guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination' (EA, 2001). |

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| GH03 | Use of appropriate occupational health and safety measures e.g., Personal Protective Equipment (PPE), and statutory health and safety compliance (e.g., compliance with the Confined Spaces Regulations, 1997 in relation to ground gas from working in confined spaces/trenches) to minimise the risks associated with anticipated/unexpected contamination. Based on risk assessment informed by site specific information. |
| GH04 | Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks. |
| GH05 | All use and storage of chemicals and fuels are to be undertaken in accordance with EA guidance and the Control of Pollution (Oil Storage) Regulations. The use and storage of chemicals and fuels will also be controlled and monitored under the Construction and Environmental Management Plan (CEMP) which will include, for example, procedures for good general construction site practices, environmental and waste management procedures, regular vehicle checks, use of spill kits, correct waste storage and disposal, use of oil-water separators as necessary (for example, for drainage from refuelling areas), collection of process water from the washout/cleaning of ready-mix concrete vehicles and equipment for treatment/disposal. |
| GH06 | The control of earthworks or materials movement (including any re-use of materials) under appropriate Environmental Permits, exemptions or CL:AIRE The definition of Waste: The development industry Code of Practice (2011). |
| GH07 | Any temporary dewatering activities during construction will be undertaken in accordance with EA guidance, and if required, an Abstraction Licence and Environmental Permit (for the discharge) and will be limited to the depth and time required to facilitate construction activities. |
| GH08 | A protocol for dealing with any unexpected contamination will be included within the CEMP. |
| Agriculture and soils | |
| AS01 | <p>Soil management measures will be included within the CEMP. Measures will include but not be limited to the following:</p> <ul style="list-style-type: none"> ● the soil resources present; ● how topsoil and subsoil will be stripped and stockpiled; ● suitable conditions for when handling soil will be undertaken, for example avoiding handling of waterlogged soil; ● indicative soil storage locations; ● how soil stockpiles will be designed taking into consideration site conditions and the nature/composition of the soil; ● specific measures for managing sensitive soils; ● suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works; ● approach to reinstating soil that has been compacted, where required; and ● details of measures required for soil restoration. |

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| AS02 | Where land is being returned to agricultural use, the appropriate soil conditions (for example through the replacement of stripped layers and the removal of any compaction) will be recreated. This will be achieved to a depth of 1.2 m (or the maximum natural soil depth if this is shallower). |
| AS03 | Access to and from residential, commercial, community and agricultural land uses will be maintained throughout the construction period or as agreed through the landowner discussions. This may require signed diversions or temporary restrictions to access. The means of access to affected properties, facilities and land parcels will be communicated to affected parties at the start of the Project, with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access will be provided in consultation with the landowner/occupier. |
| AS04 | Existing water supplies for livestock will be identified pre-construction. Where supplies will be lost or access compromised by construction works, temporary alternative supplies will be provided. Water supplies will be reinstated following construction. |
| AS05 | Consultation with affected landowners will be carried out to investigate the current extent of land drainage. A scheme of pre-construction land drainage will be designed with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working area during construction. The project may include a system of 'cut-off' drains which feed into a new header drain and the project will also take into account surface water runoff measures. |
| AS06 | Should animal bones be discovered during construction, which may indicate a potential burial site, works will cease, and advice will be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found. |
| AS07 | All movement of plant and vehicles between fields will cease in the event of a notification by the Department for Environment, Food and Rural Affairs (Defra) of a disease outbreak in the vicinity of the site that requires the cessation of activities. Advice will be sought from Defra in order to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works. |
| AS08 | Clay bungs or other vertical barriers will be constructed within trench excavations where deemed necessary by a suitably experienced person, to prevent the creation of preferential drainage pathways. |
| AS09 | Should peat deposits or peaty soils be identified, impacts to these areas would be avoided, where practicable, in line with the requirements of other disciplines and engineering constraints. A provision for this will also be included in the Outline Soil Management Plan. |
| Traffic and transport | |
| TT01 | The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set |

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| | out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads. |
| TT02 | The contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP. The contractor(s) will also be expected to monitor the number of construction vehicles between the site and the strategic road network. Deviations from the authorised routes or changes to traffic levels that are higher than the CTMP assumptions will require discussion of the need for additional mitigation measures with highways authorities. |
| TT03 | All Public Rights of Way (PRoWs) will be identified, and any potential temporary closures applied for/detailed in the DCO. All designated PRoWs crossing the working area will be managed with access only closed for short periods while construction activities occur. Any required temporary diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns. |
| Noise and vibration | |
| NV01 | Construction working will be undertaken within the agreed working hours set out within the DCO. Best practicable means to reduce construction noise will be set out within the CEMP. |
| NV02 | Contractors will be required to follow good construction practices (referred to as best practicable means (BPM)) as outlined in BS 5228-1 and BS 5228-2 to control noise and vibration respectively. BS 5228-1 and BS 5228-2 have Approved Code of Practice status (in England) under the powers conferred by Sections 71(1)(b), (2) and (3) of the Control of Pollution Act 1974, as enacted under The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015. Compliance with the good practice noise and vibration requirements stated therein are a statutory obligation under the Act. |
| NV03 | In certain instances where construction noise and/or vibration may cause a significant adverse effect at nearby NSRs, applications for prior consent under Section 61 of the Control of Pollution Act 1974 may be submitted to the relevant local authority to ensure that BPM are applied to control noise and vibration. |
| Socio-economics, recreation and tourism | |
| S01 | Provision of training to construction workers, particularly in relation to working hours and the management of emissions (dust, noise, vibration, etc). |
| S02 | PRoWs crossing the working areas will be managed in discussion with the relevant local authorities and potential temporary closures applied for discussed with the relevant local authority. Access disruption would be reduced while construction activities occur. Any required temporary diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns. |

6.A Proposed Landscape Assessment Methodology

Contents

| | |
|---|-----------|
| 6.A.1 Introduction | 1 |
| 6.A.1.1 Overview | 1 |
| 6.A.1.2 Guidance Specific to Landscape Assessment | 1 |
| 6.A.1.3 Definition of Landscape Affects | 2 |
| 6.A.2 Approach to Landscape Assessment | 3 |
| 6.A.2.1 Assessing Landscape Effects | 3 |
| 6.A.2.2 Study Area | 5 |
| 6.A.2.3 Baseline Data Gathering | 5 |
| 6.A.2.4 Establishing Landscape Sensitivity | 8 |
| 6.A.2.5 Predicting Magnitude of Change | 12 |
| 6.A.2.6 Judging Levels of Landscape Effect | 14 |
| 6.A.2.7 Mitigation and Residual Effects | 15 |
| 6.A.3 Technical Information | 16 |
| 6.A.3.1 Zone of Theoretical Visibility | 16 |
| 6.A.3.2 Assumptions and Limitations | 16 |
| 6.A.4 References | 17 |

6.A.1 Introduction

6.A.1.1 Overview

- 6.A.1.1.1 This document describes the proposed methodology to be used in the production of **Chapter 6, Landscape** of the Environmental Statement (ES) in support of the North Humber to High Marnham Project (the Project). It describes the methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of change and sets out the approach to judging the level or importance of likely landscape effects.
- 6.A.1.1.2 Landscape assessment deals with the effects on the landscape as a resource in its own right (landscape receptors), whilst the assessment of visual effects considers the changes to specific views and on the general visual amenity experienced by people (visual receptors).
- 6.A.1.1.3 Landscape and visual assessments are inter-related. Visual effects can be considered independently of the effect on the landscape in which it is seen, but landscape effects require consideration of the visual effects of the Project.

6.A.1.2 Guidance Specific to Landscape Assessment

- 6.A.1.2.1 Following the approach to the Environmental Impact Assessment (EIA) set out in **Chapter 5, EIA Approach and Methodology**, the landscape assessment, cumulative landscape assessment and presentation of landscape effects will be carried out in line with relevant legislation and standards, as well as the following guidelines, in so far as they are relevant to the Project:
- The Holford Rules – Guideline for the Routeing of New High Voltage Overhead Transmission Lines (Ref 6.A.1);
 - The Horlock Rules – Guidelines on the Siting and Design of National Grid Substations (Ref 6.A.2);
 - Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3) (Ref 6.A.3);
 - Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals (Ref 6.A.4);
 - Landscape Institute (2021) Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations (Ref 6.A.5);
 - Natural England (2014) An Approach to Landscape Character Assessment (Ref 6.A.6);
 - Natural England (2019) An Approach to Landscape Sensitivity Assessment – to Inform Spatial Planning and Land Management (Ref 6.A.7);
 - National Grid (2012) Our Approach to the Design and Routeing of New Electricity Transmission Lines (Ref 6.A.8); and

- Planning Inspectorate (PINS) (2015); Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (Ref 6.A.9).

6.A.1.3 Definition of Landscape Effects

6.A.1.3.1 The assessment of landscape effects, as defined in paragraphs 5.1 and 5.2 of GLVIA3, means:

“the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner”.

6.A.1.3.2 The two categories of landscape receptor that will be considered in the assessment are:

- designated landscapes; and
- landscape character (combinations of landscape elements and aesthetic and perceptual aspects that make an area distinctive).

6.A.1.3.3 The Project may have direct (physical) effects on the landscape as well as indirect effects on landscape character which may be perceived over a wide area.

6.A.2 Approach to Landscape Assessment

6.A.2.1 Assessing Landscape Effects

6.A.2.1.1 The landscape assessment will follow the GLVIA3 approach:

- identify a study area, which is the area within which effects on the landscape would potentially be experienced. The extent of the study area will be informed by preparation of a Zone of Theoretical Visibility (ZTV) plan, which will indicate the geographical area which may be affected by the presence of the Project;
- establish baseline conditions against which the changes resulting from the Project are assessed. The baseline will be established through desk study and field work. It will include a review of the Landscape Character Areas identified by the Local Planning Authorities in published reports, an appraisal of the existing landscape (including the influence of any existing high voltage electricity infrastructure) and a judgement on the relative value of the existing landscape or view. Because most landscapes are dynamic and constantly changing, consideration will be given to how the landscape may change in the future irrespective of the Project (albeit this will not form the basis of the assessment);
- determine the sensitivity of the landscape receptors to likely change arising from the Project through consideration of the value of the landscape and the susceptibility of the landscape receptors to change arising from the Project;
- assess each identified effect on landscape receptors in terms of its size or scale, the geographical extent of the area influenced, and its duration and reversibility. This assessment will inform judgements regarding the magnitude of change; and
- apply professional judgement to give an overall judgement on the significance of effect based on consideration of the sensitivity of the receptor and the magnitude of change.

6.A.2.1.2 The significance of each landscape effect will be categorised as **major**, **moderate**, **minor**, or **negligible** and the direction of change as **beneficial** or **adverse** as follows:

- beneficial change – the Project, or part of it, would appear in keeping with existing landscape character and/or would make a positive visual and/or physical contribution to key landscape characteristics. Removal of uncharacteristic features would also be a beneficial change; and
- adverse change – the Project, or part of it, would be perceived as a note of discord in the landscape and would have a negative visual and/or physical effect on key landscape characteristics.

6.A.2.1.3 GLVIA3 notes that identifying whether an effect would be beneficial or adverse is one of the more challenging issues in landscape assessment and sets out the following criteria to guide the process of making a judgement:

- “the degree to which the proposal fits with the existing landscape character”; and
- “the contribution to the landscape that the development may make in its own right, even if it is in contrast to the existing character”. GLVIA3 Page 88, para. 5.37.

6.A.2.1.4 Paragraph 5.37 of GLVIA3 also notes that:

“the importance of perceptions of the landscape is emphasised by the European Landscape Convention, and others may of course hold different opinions on whether the effects are positive or negative, but this is not a reason to avoid making this judgment, which will ultimately be weighed against the opinions of others in the decision making process”.

Assessing Cumulative Effects

6.A.2.1.5 As required by good practice, an appraisal of the cumulative landscape effects associated with the Project will be undertaken following guidance in the Planning Inspectorate’s (PINs) Advice Note 17. Both intra-project and inter-project effects will be identified and assessed.

Intra-Project Effects

6.A.2.1.6 In addition to considering the potential effects that might arise because of the Project in combination with other developments, consideration will also be given to intra-project effects i.e., two effects on a single receptor e.g., the effects on residents of a property, which is also a listed building because of its heritage value. The potential for intra-project effects will be considered as a separate chapter in the Environmental Statement as described in **Chapter 20, Cumulative Effects**.

Inter-Project Effects

6.A.2.1.7 The inter-project assessment will consider the likely effects of the Project when seen in conjunction with other proposed and/or approved developments. The proposed extensions to the existing substations at Creyke Beck and High Marnham are subject to two separate consenting processes. For the purposes of the assessment of the Project, it is assumed that they will be approved and will proceed to construction. On this basis they will be treated as part of the baseline for the Project.

6.A.2.1.8 The Planning Inspectorate Advice Note 17 provides a methodology for assessing inter-project cumulative effects. It provides guidance about the type and scale of other developments that should be considered in the assessment of cumulative effects with other projects. The approach is split into four stages, as outlined below:

Stage 1 – the two main tasks in this stage are to establish the ‘zone of influence (ZOI)’ for each topic and then identify a ‘long list’ of other developments, by reviewing planning applications and decisions, development plans and notified potential Nationally Significant Infrastructure Projects.

Stage 2 – criteria are set for the inclusion or exclusion of developments on the long list. These will be based on overlaps in construction programmes, shared receptors or shared effect pathways.

Stage 3 – information is gathered about the shortlisted projects, including design, location, programme, and operational information and reported environmental effects.

Stage 4 – Cumulative Effects Assessment is undertaken in relation to the shortlisted developments and the findings are reported in the matrix format. The focus is on Tier 1 and 2 projects, with Tier 3 included if possible. These three tiers are described further in **Chapter 5, EIA Approach and Methodology**.

6.A.2.1.9 Existing developments, such as wind turbines and other vertical infrastructure (e.g., overhead lines and telecommunications masts), form part of the baseline environment.

6.A.2.1.10 The assessment will consider the contribution of the Project to the total cumulative effects created by the construction and operation of all the developments included in the cumulative assessment. The potential for inter-project effects will be considered as a separate chapter in the Environmental Statement as described in **Chapter 20, Cumulative Effects**.

6.A.2.2 Study Area

6.A.2.2.1 For scoping purposes an indicative study area of 5 km from the edge of the scoping boundary has been applied. For the EIA assessment, an indicative study area of 5 km from the Limits of Deviation (LoD)¹ is proposed as explained in **Chapter 6, Landscape**. At this distance, a 50 m tall pylon will appear to be approximately 0.61 cm high² in the landscape when viewed at arm's length. It will therefore be unlikely to give rise to significant landscape effects.

6.A.2.2.2 This distance will continue to be reviewed as the design of the Project progresses.

6.A.2.3 Baseline Data Gathering

6.A.2.3.1 The landscape baseline will describe the landscape of the study area – *'its constituent elements and features, its character and the way this varies spatially, its geographic extent, its history (which may require its own specialist study), its condition, the way the landscape is experienced, and the value attached to it'*. GLVIA3 Page 32, para. 3.15.

6.A.2.3.2 The baseline will describe the landscape as it appears now, together with any changes, which would arise without the Project. It will be based on published landscape character assessments, which will be verified through field survey to ensure that the information is accurate and suitably detailed for the purposes of the landscape assessment.

6.A.2.3.3 Information will be gathered from a wide range of sources including:

- OS maps and aerial photography;
- local development plans and planning policy;

¹ The study area is measured from the LOD, rather than the Order Limits, as the landscape assessment is largely concerned with the significant effects of the new 400 kV overhead line.

² Apparent height or angular size of an object is the height that an object appears at arm's length and is calculated by considering the known height of an object and distance from that object. For a 50 m tall pylon, the apparent height at 10 km is 0.31 cm, 5 km is 0.61 cm and 3 km is 1.02 cm.

- Natural England’s reports identifying a candidate area within the Yorkshire Wolds for potential designation as AONB;
- feedback from planning officers;
- existing landscape character assessments;
- management plans; and
- site visits.

6.A.2.3.4 The baseline will include a description of the relative value of the landscape, which is unrelated to the nature of the Project. TGN 02-21 published by the Landscape Institute in 2021, defines ‘landscape value’ as *“the relative value or importance attached to different landscapes by society on account of their landscape qualities”*. TGN 02-21 Page 3.

6.A.2.3.5 An area of landscape may be valued for many reasons – for example its condition, scenic beauty, tranquillity or remoteness, its recreation opportunities, nature conservation or its historic and cultural associations. Development will not necessarily be incompatible with the valued qualities of a landscape as this will depend on the nature of the proposal and the characteristics of the landscape.

6.A.2.3.6 Nationally and internationally designated landscapes are generally accorded the highest value. The absence of a formal landscape designation, however, does not necessarily imply that a landscape is of lower value. GLVIA3 describes value as *“... the relative value that is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons. Considering value at the baseline stage will inform later judgements about the significance of effects. ...A review of existing landscape designations is usually the starting point in understanding landscape value, but the value attached to undesignated landscapes also needs to be carefully considered and individual elements of the landscape – such as trees, buildings or hedgerows – may also have value”*. GLVIA3 Page 80, para. 5.19

6.A.2.3.7 **Table 6.A.2.1** defines landscapes of international/national, regional/local, community and limited importance.

Table 6.A.2.1: Typical Importance of Landscape Receptors

| Category | Indicators |
|----------------------------|--|
| International/ National | Landscapes which are internationally or nationally designated for their landscape value e.g., National Parks and Areas of Outstanding Natural Beauty (AONB). |
| Regional/Local | Regionally or locally designated landscapes such as Special Landscape Areas (SLAs), or Areas of Great Landscape Value (AGLV). |
| Community Importance | Everyday landscapes, which may be valued by the local community but have little or no wider recognition of their value. |
| Limited | Despoiled or degraded landscape with little or no evidence of being valued by a community. |

- 6.A.2.3.8 The quality of a valued landscape is often explained in a citation for a designation, but where this isn't available, value can be determined through the application of a criteria-based comparative landscape approach supported by published documentation such as tourist leaflets, art and literature. The value of a landscape or view can also be informed by consultation feedback from people with local knowledge. This is in line with the latest guidance from Natural England (Ref 6.A.7) and the European Landscape Convention (Ref 6.A.10), which promote an 'all-landscapes approach', founded on the recognition of value in all landscapes.
- 6.A.2.3.9 The appraisal of landscape value includes consideration of the following factors:
- landscape character and quality;
 - importance in terms of designations;
 - scenic quality;
 - conservation interests;
 - recreational value;
 - perceptual aspects and tranquillity; and
 - associations.
- 6.A.2.3.10 The relative value of the landscape is described as **very high, high, medium or low** by applying the indicators listed in **Table 6.A.2.2**. Judgements will be supported by narrative description to explain the conclusions reached.

Table 6.A.2.2: Indicators of Landscape Value

| Category | Indicators |
|-----------------|---|
| Very High | <p>Landscape of very high scenic quality, with all or most of the scenic/special qualities evident, including its flora, fauna, geological and geographical elements and features.</p> <p>Typically, internationally, or nationally designated e.g., National Park or AONB.</p> <p>Very good condition/very well-managed and intact.</p> <p>Historic interest of designated national or international importance, which contributes substantially to landscape character.</p> <p>Mainly characterised by natural components that are rare and distinctive.</p> <p>Very high recreational value which contributes substantially to recreational/visitor experience.</p> <p>Rich and valued cultural associations.</p> <p>Unique sense of place.</p> <p>No discordant features.</p> |
| High | <p>Landscape of high scenic quality, with considerable evidence of the scenic/special qualities, including its flora, fauna, geological and geographical elements, and features.</p> <p>Typically designated at a regional or local level such as SLA or AGLV.</p> |

| Category | Indicators |
|-----------------|--|
| | <p>Good condition/well-managed and largely intact.</p> <p>Many natural components.</p> <p>Historic interest which contributes to landscape character.</p> <p>Recreational value which contributes to recreational/ visitor experience.</p> <p>Valued cultural associations.</p> <p>Strong sense of place.</p> <p>Occasional discordant features.</p> |
| Medium | <p>A landscape with some evidence of scenic/special qualities, albeit with a degree of erosion due to the presence of infrastructure and/or inappropriate built development.</p> <p>May be valued by the local community but has little or no wider recognition of its value.</p> <p>Average condition with some intactness but scope to improve management for land use.</p> <p>Limited historic interest.</p> <p>Some natural components.</p> <p>Limited recreational value and few visitors.</p> <p>No or very few recorded cultural associations.</p> <p>Some features worthy of conservation.</p> <p>Some noticeable discordant features.</p> |
| Low | <p>A landscape with greater presence of infrastructure and and/or inappropriate built development which impacts on the scenic/special qualities of the landscape or one of low scenic quality or with many of the scenic/special qualities eroded.</p> <p>Little or no evidence of being valued by a community.</p> <p>Lack of management has resulted in degradation and poor condition.</p> <p>Limited to no historic interest.</p> <p>Limited to no recreational value.</p> <p>No recorded cultural associations.</p> <p>Frequent or dominant discordant features.</p> <p>Disturbed or derelict land requiring treatment.</p> |

6.A.2.4 Establishing Landscape Sensitivity

- 6.A.2.4.1 The next step in assessing the importance of the likely landscape effects is to determine the sensitivity of the landscape receptors to the Project.
- 6.A.2.4.2 In accordance with page 158 of GLVIA3, landscape sensitivity is assessed in terms of the value of the landscape receptor and its susceptibility to change arising from the Project. As explained above, the value attached to a landscape receptor will be determined as part of the baseline and is unrelated to the nature of the development

proposed. As set out in GLVIA3 Page 88, para. 5.40, the susceptibility of the landscape to change is the ability of the

“landscape receptor (whether it be the overall character or quality/condition of a particular landscape area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the Project without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies”.

6.A.2.4.3 Susceptibility varies depending on the character of the landscape and the nature of the development. It is therefore tailored to the particular project. Determining the susceptibility of the landscape receptor requires:

- identifying the key components of the landscape that are likely to be affected by the Project; and
- identifying the various aspects of the Project, at all stages in its lifecycle, that are likely to have an effect on those key components.

6.A.2.4.4 Components of the landscape that typically inform the susceptibility of the landscape to a 400 kV overhead line are:

- Landform (Holford Rules 4 and 5/Horlock Rules 10 and 11);
 - steep, dramatic, or elevated landforms are typically more susceptible to 400 kV overhead lines. This is because they are often prominent and distinctive in character and can also lead to skylining of pylons and conductors. Single and narrow ridges are particularly vulnerable especially where the slopes of the ridgeline are well defined/steep, or with rock outcrops. More complex landforms may provide some screening/ backclothing opportunities for pylons, but care has to be taken not to dominate intricate landforms.
 - broad valleys with smooth and regular lines can be less susceptible to 400 kV overhead lines because they have greater potential to provide backgrounding and enclosure.
- Landcover pattern (Holford Rules 5 and 6/Holford Rule 3);
 - this factor is not concerned with the material sensitivity of the particular type of land cover (which is considered in other environmental topics), but with the character of the landscape created through the landscape pattern, which includes the distribution of vegetation.
 - complex landscapes comprising a variety or mosaic of characteristic or susceptible landscape features such as trees and woodlands, hedgerows or traditional/historic field patterns, are typically more vulnerable to 400 kV overhead lines than simple uncluttered landscapes where there are few characteristic landscape features, or where such patterns have been obscured.
 - where landscape complexity is due to past or current commercial/industrial influences, this indicates lower rather than higher susceptibility. The presence of modern (particularly vertical) structures such as existing high voltage electricity infrastructure, wind turbines, transport, utility or communication infrastructure or industrial development may reduce landscape susceptibility to a new 400 kV overhead line, as may the visible influence of quarrying, commercial forestry, or landfill.

- whilst trees and woodland offer the potential to screen pylons (particularly in combination with landform), care must be taken not to allow the pylons to detract from or dominate locally distinctive features such as tree knolls, veteran trees, or avenue trees.
- Landscape Scale;
 - scale is typically related to landform or landcover.
 - larger scale landscapes, where pylons appear more in proportion, are typically less susceptible to 400 kV overhead lines than small scale or intimate landscapes, where pylons are likely to be more prominent. A large height differential between valley floors and hilltops may help reduce susceptibility by lessening the perceived size of the pylons but care has to be taken to ensure that the apparent scale of the landform is not diminished by the height of the pylons.
 - comparison of pylons with landscape features such as field patterns, landform individual trees and buildings may also emphasise their size.
- Prominent Landscape Features and Skylines (Holford Rule 4/Holford Rule 4); and
 - landscapes with distinctive ridges or skylines are likely to be more susceptible to 400 kV overhead line than skylines that are less prominent or have been affected by visually intrusive structures. The presence of distinctive or historic landscape features such as hilltop monuments, church towers, vernacular villages, or other landmark features (e.g., country houses, mansions, historic features), increases susceptibility as overhead lines can detract from or conflict with these features. Skylines which form prominent settings for settlement are also likely to be more susceptible as an overhead line may interrupt the relationship between these features and their landscape settings.
- Settlement Pattern (Holford Rules 1 and 2/Holford Rule 5 and 6).
 - this relates to settlement pattern in relation to landscape character, rather than to visibility and views, which is discussed separately.
 - a settlement pattern which is closely related to the pattern and form of the landscape, particularly where traditional patterns are intact, is potentially more sensitive to a 400 kV overhead line. Conversely, a settlement pattern which is less closely related to landscape, for example larger scale, built development rising over ridgelines or masking field patterns, is likely to be less susceptible.

6.A.2.4.5 The susceptibility of designated landscapes is also influenced by the nature of the special qualities and purposes of designation and/or the valued elements, qualities, or characteristics, indicating the degree to which these may be unduly affected by the Project.

6.A.2.4.6 The susceptibility of the landscape to change will be categorised as **very high**, **high**, **medium**, or **low** by applying the indicators listed in **Table 6.A.2.3**. Judgements will be supported by narrative description to explain the conclusions reached.

Table 6.A.2.3: Indicators of landscape receptor susceptibility

| Category | Indicators |
|-----------|--|
| Very High | The landscape receptor is very highly susceptible in that it is unable to accommodate the Project without undue negative consequences for the baseline situation. Attributes that make up the character of the landscape offer almost no opportunities for accommodating the change without its key characteristics and landscape elements being fundamentally altered or permanently lost, leading to a different landscape character. The Project does not accord with planning policies and strategies and also conflicts with the special qualities or purpose of any designation. |
| High | The landscape receptor is highly susceptible in that it is more or less unable to accommodate the Project without undue negative consequences for the baseline situation. Attributes that make up the character of the landscape offer limited opportunities for accommodating the change without its key characteristics being fundamentally altered, leading to a different landscape character. The Project does not accord with planning policies and strategies and conflicts with the special qualities or purpose of any designation. |
| Medium | The landscape receptor has some ability to accommodate the Project without undue negative consequences for the baseline situation. Attributes that make up the character of the landscape offer some opportunities for accommodating the change without key characteristics being fundamentally altered. There would be some consequences for the achievement of landscape planning policies and strategies. |
| Low | The landscape receptor is more able to accommodate the Project without undue negative consequences for the baseline situation. Attributes that make up the character of the landscape are more resilient to being changed by the type of development proposed. Only individual elements and/or features, or a particular aesthetic and perceptual aspect may be affected. The Project accords with planning policies and strategies and does not conflict with the special qualities or purpose of any designation. |

6.A.2.4.7 An overall judgement on the sensitivity of the landscape receptors will then be made by combining the judgements about the value attached to the landscape with its susceptibility to the changes arising from the Project.

6.A.2.4.8 Care will be taken to ensure that views across the flat fenland and similar open landscapes are given due consideration when judging sensitivity. This because although these landscapes are flat and relatively featureless, these are attractive and valued characteristics.

6.A.2.4.9 The sensitivity of the landscape will be categorised as **very high**, **high**, **medium**, or **low**. Judgements will be supported by narrative description linked back to evidence from the baseline study to explain the conclusions reached.

6.A.2.5 Predicting Magnitude of Change

6.A.2.5.1 GLVIA3 sets out the criteria which should be considered in reaching a professional judgement on the magnitude of landscape change. These include *“its size or scale, the geographical extent of the area influenced, and its duration and reversibility”*. GLVIA3 Page 90, para. 5.48.

Size and Scale of Effect

6.A.2.5.2 For landscape elements or features this depends on the extent of existing landscape elements or features that would be lost or changed, the proportion of the total extent that this represents, and the contribution of that element to the character of the landscape.

6.A.2.5.3 In terms of landscape character, this reflects the degree to which the character of the landscape would change as a result of removal or addition of landscape components, and how the changes would affect its key characteristics. The size/scale of effect is described as **large, medium, small** or **barely perceptible**.

Geographical Extent of Effect

6.A.2.5.4 The geographical extent over which the landscape effect would arise will be described as large, medium or small based on the definitions set out on page 91 of GLVIA3 and the published landscape character areas/types:

- Small – at the site level or its immediate setting;
- Medium – at the scale of the landscape; type/character area within which the Project lies; and
- Large – influencing several landscape character types/areas.

Duration and Reversibility

6.A.2.5.5 The design life of the Project is at least 80 years but with regular maintenance is likely to extend further.

6.A.2.5.6 Paragraph 5.51 of GLVIA3 states that duration *“can usually be simply judged on a scale such as short term, medium term or long term”*. For the purposes of the assessment, duration will be determined in relation to the phases of the Project, as follows:

- **short term** – assumed to cover construction plus one-year reinstatement;
- **medium term** – assumed to be 2-15 years post construction and include the effects of permanent vegetation loss on the baseline environment; and
- **long term** – assumed to be of a duration that extends longer than 15 years post construction once any committed mitigation planting has achieved its design intention.

6.A.2.5.7 The duration of the effect will also be described as **temporary, transient** (whether continuous or intermittent) or **seasonal** (views which would be subject to seasonal leaf cover).

- 6.A.2.5.8 In accordance with the principles contained within GLVIA3, reversibility will be reported as **reversible**, **potentially reversible** or **irreversible** (i.e., permanent), and is related to whether the change can be reversed at the end of the phase of development under consideration (i.e., at the end of construction or at the end of the operational lifespan of the Project).

Making Judgements

- 6.A.2.5.9 Combining the three separate considerations (size/scale of effect, geographical extent of the effect and duration and reversibility) in one rating for magnitude of change can distort the aim of identifying significant effects. For example, an increased magnitude of change, based on size/scale, may be reduced to a lower rating if it occurred in a localised area or for a short duration. This might mean that a potentially significant effect may be overlooked if impacts are moderated down due to their geographical extents and/or duration/reversibility. To counter this, judgements on magnitude will be based on the size/scale of effect and adjusted up or down to reflect the duration of change and whether it is likely to be reversible. A separate description of the geographical distribution of effects across the study area will be provided in the landscape assessment summary.
- 6.A.2.5.10 The magnitude of landscape change will be categorised as **large**, **medium**, **small** or **negligible** by applying the indicators listed in **Table 6.A.2.4**. Judgements will be supported by narrative description to explain the conclusions reached.

Table 6.A.2.4: Indicators of magnitude of landscape change

| Category | Indicators |
|----------|--|
| Large | <p>Considerable change to the landscape, with undesirable consequences for the elements, character, and quality of the baseline landscape. The Project will form a prominent landscape element and post development the baseline situation will be substantially changed.</p> <p>Physical loss of landscape features that are not replaceable or are replaceable only in the long term.</p> <p>If designated, affecting the reasons for the designation.</p> <p>The duration/reversibility of effect is likely to be long-term and non-reversible.</p> |
| Medium | <p>Noticeable change to the landscape over a wide area or conspicuous change over a limited area, with some undesirable consequences for the elements, character, and quality of the baseline landscape. The Project will form a conspicuous landscape element and post development the baseline situation may be noticeably changed.</p> <p>Physical loss of landscape features that are replaceable in the medium term.</p> <p>If designated, unlikely to affect the reasons for the designation.</p> <p>The duration/reversibility of effect is likely to be long-term, but potentially reversible.</p> |
| Small | <p>Slight change to the landscape with few undesirable consequences for the elements, character, and quality of the</p> |

| Category | Indicators |
|------------|--|
| | <p>baseline landscape. The Project will be perceptible but post development, the baseline landscape may exhibit some differences, but will be largely unchanged.</p> <p>Physical loss of landscape features that are replaceable in the medium term.</p> <p>If designated, not affecting the reasons for the designation.</p> <p>The duration/reversibility of effect is likely to be medium-term and non-reversible.</p> |
| Negligible | <p>Inconspicuous change to the landscape over a wide area or slight change over a limited area, with no undesirable consequences for elements, character, and quality of the baseline landscape. The development will be just perceptible and post development, the baseline landscape will appear unchanged.</p> <p>Physical loss of landscape features that are replaceable in the short term.</p> <p>If designated, not affecting the reasons for the designation.</p> <p>The duration/reversibility of effect is likely to be short-term and reversible.</p> |

6.A.2.5.11 The assessment will also identify areas where no landscape change is anticipated. In these instances, 'no change' is inserted into the appropriate magnitude of effect column and the resulting effect is identified as 'no effect'.

6.A.2.6 Judging Levels of Landscape Effect

6.A.2.6.1 The final step in the assessment will be to predict the likely significant landscapes effects that may arise.

6.A.2.6.2 The methodology adopts the 'overall profile' approach in GLVIA3 whereby, 'all the judgements against the individual criteria can be arranged in a table to provide an overall profile of each identified effect'. GLVIA3 Page 92, para 5.55. This determination requires the application of professional judgement and experience to balance the different variables.

6.A.2.6.3 Judgements will be made on a case-by-case basis, guided by the matrix of sensitivity set out in Image 5.3, **Chapter 5, EIA Approach and Methodology**. Significance will be categorised as **major, moderate, minor**, or **negligible** and the direction of change as **beneficial** or **adverse**.

6.A.2.6.4 Each of the significance categories will cover a broad range of effects and represents a continuum or sliding scale. Where an effect falls at the upper or lower end of the category, this will be noted and explained.

6.A.2.6.5 Paragraph 5.56 of GLVIA3 advises that there are no hard and fast rules about what makes a significant landscape effect, and there cannot be a standard approach since circumstances vary with the location and landscape context and with the type of development noting that, at opposite ends of the spectrum:

- *“major loss or irreversible negative effects over an extensive area, on elements and/or aesthetic and perceptual aspects that are key to the character of nationally valued landscapes are likely to be of the greatest significance;*
- *reversible effects of short duration, over a restricted area, on elements and/or aesthetic and perceptual aspects that contribute to but are not key characteristics of the character of landscapes of community value are likely to be of the least significance and, may depending on the circumstances, be judged as not significant; and*
- *where assessments of significance place landscape effects between these extremes, judgements must be made about whether or not they are significant, with full explanations of why these conclusions have been reached”.*

6.A.2.6.6 For each landscape receptor, a narrative description explaining the rationale for the conclusion reached regarding the level of the effects, will be provided in the main text.

6.A.2.7 Mitigation and Residual Effects

6.A.2.7.1 If the design has been developed iteratively with the assessment process, then mitigation measures may not be necessary as all potentially significant adverse effects, which can be avoided or reduced, may have been designed out.

6.A.2.7.2 The most effective mitigation measures are ones which are integral to the scheme. A distinction will therefore be made between measures designed as an intrinsic part of the scheme (primary or embedded measures) and those which are intended to specifically counteract any residual negative effects of the Project (secondary measures).

6.A.2.7.3 Significant residual landscape effects remaining after proposed mitigation will be summarised as the final step in the assessment process. Significance will be categorised as major, moderate, minor, or negligible and the direction of change as beneficial or adverse.

6.A.2.7.4 Each of the significance categories will cover a broad range of effects and represents a continuum or sliding scale. Where an effect falls at the upper or lower end of the category, this will be noted and explained.

6.A.3 Technical Information

6.A.3.1 Zone of Theoretical Visibility

- 6.A.3.1.1 A ZTV map will be prepared to inform the geographic extent of the area potentially affected by the presence of the new 400 kV overhead line. It will also help to refine the study area and support the assessment of effects. ZTVs will also be prepared for the existing 400 kV overhead lines and for the two taller pylons at the River Ouse crossing.
- 6.A.3.1.2 The ZTV will indicate the theoretical visibility of the pylons. In some locations, extensive vegetation cover will mean the actual extent of visibility is substantially less than that shown in the ZTV, and professional judgement will be used to further refine the study area to focus on likely significant effects.
- 6.A.3.1.3 The ZTVs will be based on the most recently available topographic data. A datum of 1.6 m above ground level will be used to represent the eye level view of an average height person. The validity of the ZTV will be checked on site, using professional judgement, to ensure the output is a fair representation of the theoretical visibility of the Project, in line with guidance provided by the Landscape Institute.
- 6.A.3.1.4 The ZTV will take account of the following factors:
- the existing topography using OS terrain 50 data;
 - existing buildings by applying a 7 m average height to the OS Master Map layer; and
 - existing woodland cover by applying a 15 m average height to the National Forest Inventory which is produced by the Forestry Commission and records all forests and woodlands with an area of 0.5 ha and over.
- 6.A.3.1.5 Individual and small groups of trees will be excluded as, during winter, these will provide only minimal screening.

6.A.3.2 Assumptions and Limitations

- 6.A.3.2.1 The landscape assessment will be based on professional judgement and will consider the effects that the Project may have on landscape receptors.
- 6.A.3.2.2 All baseline surveys will be carried out on publicly accessible land and in accordance with industry accepted guidance. In instances where site access is not available from publicly accessible land, professional judgement will be used to approximate and record the likely effects.
- 6.A.3.2.3 It is not proposed to prepare a ZTV for the construction phase of the Project as there is a great degree of variability in the extent and timeframes of visibility of construction activity. Also, tall construction plant (for example tower cranes and piling rigs) rarely gives rise to significant landscape and visual effects as it is present at each pylon location for a short period of time.

6.A.4 References

- Ref 6.A.1 National Grid; Holford Rules
(<https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf>)
- Ref 6.A.2 National Grid; Horlock Rules
(<https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf>)
- Ref 6.A.3 Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3)
- Ref 6.A.4 Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals
- Ref 6.A.5 Landscape Institute (2021) Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations
- Ref 6.A.6 Natural England (2014); An Approach to Landscape Character Assessment
- Ref 6.A.7 Natural England (2019) An Approach to Landscape Sensitivity Assessment – to Inform Spatial Planning and Land Management
- Ref 6.A.8 National Grid (2012) Our Approach to the Design and Routeing of New Electricity Transmission Lines
- Ref 6.A.9 Planning Inspectorate (2015) Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (AN17)
- Ref 6.A.10 European Landscape Convention ETS No.176 ratified on the 21 November 2006

7.A Proposed Visual Assessment Methodology

Contents

| | |
|--|-----------|
| 7.A.1 Introduction | 1 |
| 7.A.1.1 Overview | 1 |
| 7.A.1.2 Guidance Specific to Visual Assessment | 1 |
| 7.A.1.3 Definition of Visual Affects | 2 |
| 7.A.2 Approach to Visual Assessment | 3 |
| 7.A.2.1 Assessing Visual Effects | 3 |
| 7.A.2.2 Study Area | 5 |
| 7.A.2.3 Baseline Data Gathering | 5 |
| 7.A.2.4 Establishing Visual Sensitivity | 7 |
| 7.A.2.5 Predicting Magnitude of Change | 9 |
| 7.A.2.6 Judging Levels of Visual Effect | 12 |
| 7.A.2.7 Mitigation and Residual Effects | 13 |
| 7.A.3 Residential Visual Amenity | 14 |
| 7.A.3.1 Background | 14 |
| 7.A.4 Technical Information | 18 |
| 7.A.4.1 Baseline Photography | 18 |
| 7.A.4.2 Wireframes | 18 |
| 7.A.4.3 Zone of Theoretical Visibility | 19 |
| 7.A.4.4 Assumptions and Limitations | 19 |
| 7.A.5 References | 20 |

7.A.1 Introduction

7.A.1.1 Overview

- 7.A.1.1.1 This document describes the proposed methodology to be used in the production of **Chapter 7, Visual** of the Environmental Statement (ES) in support of the North Humber to High Marnham Project (the Project). It describes the methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of change and sets out the approach to judging the level or importance of likely visual effects.
- 7.A.1.1.2 Landscape assessment deals with the effects on the landscape as a resource in its own right (landscape receptors), whilst the assessment of visual effects considers the changes to specific views and on the general visual amenity experienced by people (visual receptors).
- 7.A.1.1.3 Landscape and visual assessments are inter-related. Visual effects can be considered independently of the effect on the landscape in which it is seen, but landscape effects require consideration of the visual effects of the Project.

7.A.1.2 Guidance Specific to Visual Assessment

- 7.A.1.2.1 Following the approach to the Environmental Impact Assessment (EIA) set out in **Chapter 5, EIA Approach and Methodology**, the visual assessment, cumulative visual assessment and presentation of visual effects will be carried out in line with relevant legislation and standards, as well as the following guidelines, in so far as they are relevant to the Project:
- The Holford Rules – Guideline for the Routeing of New High Voltage Overhead Transmission Lines (Ref 7.A.1);
 - The Horlock Rules – Guidelines on the Siting and Design of National Grid Substations (Ref 7.A.2);
 - Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3) (Ref 7.A.3);
 - Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals (Ref 7.A.4);
 - Landscape Institute (2019) Technical Guidance Note 02/19 Residential Visual Amenity Assessment (Ref 7.A.5);
 - National Grid (2012) Our Approach to the Design and Routeing of New Electricity Transmission Lines (Ref 7.A.6); and
 - Planning Inspectorate (PINS) (2015); Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (Ref 7.A.7).

7.A.1.3 Definition of Visual Effects

7.A.1.3.1 The assessment of visual effects, as defined in paragraph 2.21 of the GLVIA3, means impacts or changes to ‘*specific views and the general visual amenity experienced by people*’.

7.A.1.3.2 In accordance with GLVIA3, the assessment will focus on public views experienced by those groups of people who are likely to be most sensitive to change and therefore most likely to experience significant effects from the Project. These include:

- local communities – people living and moving around defined settlements, smaller scattered communities and more isolated individual residences (where views contribute to the landscape setting enjoyed by residents in the area);
- recreational receptors – people using recreational routes including public rights of way, national trails and National Cycle Routes (NCN) where the wider landscape and views may be appreciated whilst undertaking the activity; and
- tourists and visitors – visiting recreational features and attractions (some of which may have historic or cultural heritage importance) where an appreciation of the wider landscape and views is an integral part of the activity. This includes people travelling along recognised scenic road routes.

7.A.1.3.3 It is not proposed to include effects on people using the road network or working within the study area because an appreciation of the wider landscape and views is not typically imperative to the activity being undertaken. These receptors are generally judged to be of lower susceptibility to changes in the view and will experience views of the Project which are often shared by receptors of greater susceptibility.

Residential Visual Amenity

7.A.1.3.4 The routeing process seeks to avoid potential effects on the views and visual amenity of residential receptors wherever possible. The EIA process will consider field observations on the orientation of properties, the likely availability of views from properties and their curtilages and the presence of intervening screening (e.g. localised landform, woodland and vegetation, buildings and other landscape features).

7.A.1.3.5 Potential effects on views from residential properties close to the Project will continue to be considered during the ongoing design process, and where significant effects are predicted, individual residential properties will be included in the assessment.

7.A.2 Approach to Visual Assessment

7.A.2.1 Assessing Visual Effects

7.A.2.1.1 The visual assessment will follow the GVLIA3 approach:

- identify a study area, which is the area within which significant effects on views and general visual amenity would potentially be experienced. The extent of the study area will be informed by preparation of a Zone of Theoretical Visibility (ZTV) plan, which will indicate the areas from where the Project may be visible;
- establish baseline conditions against which the changes resulting from the Project are assessed. The baseline will be established through desk study and field work. It will include an identification of the visual receptors and an appraisal of the existing visibility, including a judgement on the relative value of the views and general visual amenity currently experienced. It will also include consideration of the future baseline. This is the way the landscape and consequently the views experienced is likely to evolve due to other changes, irrespective of the Project (albeit this will not form the basis of the assessment);
- determine the sensitivity of the visual receptors to likely change arising from the Project through consideration of the value of the view and the susceptibility of the visual receptors to change arising from the Project;
- assess each identified effect on visual receptors in terms of its size or scale, the geographical extent of the area influenced, and its duration and reversibility. This assessment will inform judgements regarding the magnitude of change; and
- apply professional judgement to give an overall judgement on the significance of effect based on consideration of the sensitivity of the receptor and the magnitude of change.

7.A.2.1.2 The significance of each visual effect will be categorised as **major**, **moderate**, **minor**, or **negligible** and the direction of change as **beneficial** or **adverse** as follows:

- beneficial change – the Project, or part of it, would be perceived as a positive addition in the context of the existing view; and
- adverse change – the Project, or part of it, would be perceived as discordant in the context of the existing view; and

7.A.2.1.3 GLVIA3 notes that identifying whether an effect would be beneficial or adverse is one of the more challenging issues in visual assessment. Paragraph 6.28 of GLVIA3 notes that decisions:

“need to be based on a judgement about whether the changes will affect the quality of the visual experience for those groups of people who will see the changes, given the nature of the existing views”.

Assessing Cumulative Effects

- 7.A.2.1.4 As required by good practice, an appraisal of the cumulative visual effects associated with the Project will be undertaken following guidance in the Planning Inspectorate Advice Note 17. Both intra-project and inter-project effects will be identified and assessed.

Intra-Project Effects

- 7.A.2.1.5 In addition to considering the potential effects that might arise as a result of the Project in combination with other developments, consideration will also be given to intra-project effects i.e., two effects on a single receptor e.g., the effects on residents of a property, which is also a listed building because of its heritage value. The potential for intra-project effects will be considered as a separate chapter in the Environmental Statement as described in **Chapter 20, Cumulative Effects**.

Inter-Project Effects

- 7.A.2.1.6 The inter-project assessment will consider the likely effects of the Project when seen in conjunction with other proposed and/or approved developments. The proposed extensions to the existing substations at Creyke Beck and High Marnham are subject to two separate consenting processes. For the purposes of the assessment of the Project, it is assumed that they will be approved and will proceed to construction. On this basis they will be treated as part of the baseline for the Project.

- 7.A.2.1.7 The Planning Inspectorate Advice Note 17 provides a methodology for assessing inter-project cumulative effects. It provides guidance about the type and scale of other developments that should be considered in the assessment of cumulative effects with other projects. The approach is split into four stages, as outlined below:

Stage 1 – two main tasks in this stage are to establish what the 'zone of influence (ZOI)' is for each topic and to then identify a 'long list' of other developments, by reviewing planning applications, development plans.

Stage 2 – criteria are set for the inclusion or exclusion of developments on the long list. These will be based on overlaps in construction programmes, shared receptors, or shared effect pathways.

Stage 3 – information is gathered about the shortlisted projects, including design, location, programme, and operational information, and reported environmental effects.

Stage 4 – Cumulative Effects Assessment is undertaken in relation to the shortlisted developments and the findings are reported in the matrix format. The focus is on Tier 1 and 2 projects, with Tier 3 included if possible. These three tiers are described further in **Chapter 5, EIA Approach and Methodology**.

- 7.A.2.1.8 Existing developments, such as wind turbines and other vertical infrastructure (e.g. overhead lines and telecommunications masts), form part of the baseline environment.

- 7.A.2.1.9 The assessment will consider the contribution of the Project to the total cumulative effects created by the construction and operation of all the developments included in the cumulative assessment. The potential for inter-project effects will be considered as a separate chapter in the Environmental Statement as described in **Chapter 20, Cumulative Effects**.

7.A.2.2 Study Area

- 7.A.2.2.1 For scoping purposes an indicative study area of 5 km from the edge of the Scoping Boundary will be applied. For the EIA assessment, an indicative study area of 5 km from the Limits of Deviation (LoD)¹ is proposed. At this distance, a 50 m tall pylon will appear to be approximately 0.61 cm high² in the landscape when viewed at arm's length. It will therefore be unlikely to give rise to significant visual effects.
- 7.A.2.2.2 This distance will continue to be reviewed as the design of the project progresses. Should particular concerns be raised about any sensitive receptors at (or beyond) 5 km then these will be considered. The most likely scenario where this may arise is when a sensitive receptor has views of single or paired pylons silhouetted against the sky on an open and undeveloped ridgeline as they are more likely to draw the eye. The need for taller pylons at the River Ouse crossing may also require consideration of views in excess of 5 km.

7.A.2.3 Baseline Data Gathering

- 7.A.2.3.1 The visual baseline will establish the general area from which the Project may be visible, 'the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and the visual amenity at those points'. GLVIA3 Page 32, para. 3.15.
- 7.A.2.3.2 Information will be gathered from a wide range of sources including:
- OS maps and aerial photography;
 - local development plans and planning policy;
 - feedback from planning officers;
 - visibility overviews within existing landscape character assessments;
 - management plans; and
 - site visits.
- 7.A.2.3.3 Where existing information is used, this will be verified on site to ensure that the information is accurate and appropriate for the purposes of the visual assessment.

Viewpoint Selection

- 7.A.2.3.4 Visual effects will be reported by reference to a series of representative and specific viewpoints to be agreed with local planning authorities and other relevant stakeholders.
- 7.A.2.3.5 Viewpoint locations will be carefully selected to provide suitable representation of the likely visibility of the Project. They will all be located in publicly accessible locations. The final viewpoint locations will be confirmed once an indicative route alignment has been identified and will be subject to micro-siting in the field to take account of the presence of localised screening. Each viewpoint will be visited and

¹ The study area is measured from the LOD, rather than the Order Limits, as the landscape assessment is largely concerned with the significant effects of the new 400 kV overhead line.

² Apparent height or angular size of an object is the height that an object appears at arm's length and is calculated by considering the known height of an object and distance from that object. For a 50 m tall pylon, the apparent height at 10 km is 0.31 cm, 5 km is 0.61 cm and 3 km is 1.02 cm.

360-degree photography from each of the viewpoints will be undertaken in accordance with guidance published by the Landscape Institute to illustrate the existing characteristics of the view. These characteristics will be detailed in the baseline description, prior to undertaking the assessment of visual effects.

7.A.2.3.6 Viewpoint selection will be based on desk-top analysis, consultation feedback and site visits undertaken. Viewpoints can be representative, specific, or illustrative:

- *“representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of users of selected public footpaths and bridleways;*
- *specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and*
- *illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations”.* GLVIA3 Page 109, para. 6.19.

7.A.2.3.7 It should be emphasised that it is the people who would be experiencing the view from the viewpoint that are the receptor, not the viewpoint itself. The location affords the view to the recipient, and whilst the location cannot change, the opinion of the viewer can vary as people will generally have different responses to a change in view depending on their location, the activity they are engaged in and other factors, including the weather and the time of day/year.

7.A.2.3.8 The visual baseline will provide information on the:

- type and relative numbers of people (visual receptors) likely to be affected;
- location, nature, and characteristics of the existing views, including elements and features which influence the view; and
- value attached to view.

7.A.2.3.9 The value of the views depends on:

- *“recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations; and*
- *indicators of the value attached by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment... and references to them in literature or art...”* GLVIA3 Page114, para. 6.37.

7.A.2.3.10 It also depends on the character and quality of the particular view experienced, which will be identified for each viewpoint through desktop and field survey and described in the baseline description for each viewpoint.

7.A.2.3.11 The viewpoint analysis will involve visiting each viewpoint location. To ensure optimal visibility, the photographs taken to illustrate the view will wherever possible be taken in fine weather.

- 7.A.2.3.12 The value of the view will be categorised as **very high, high, medium, or low** by applying the indicators listed in **Table 2.1**. Judgements will be supported by narrative description to explain the conclusions reached.

Table 2.1: Indicators of view value

| Category | Indicators |
|-----------|---|
| Very High | Iconic view of national or international importance, or a view which is associated with a nationally or internationally designated landscape or heritage asset, the cultural associations of which are widely recognised in art, literature, or other media. |
| High | Highly scenic view associated with a landscape or heritage asset of national or regional importance, the cultural associations of which are regularly recognised in art, literature, or other media. |
| Medium | The value of such views may have been identified as part of the consultation process and through site visits. Elements or features within the view are likely to be in good condition, with few discordant elements or features. |
| Low | Although the view may be valuable to the local community, the location has no formal planning status, is in an area of ordinary landscape value with some discordant elements or features. The value of such views to the local community may have been identified as part of the consultation process and through site visits. |

7.A.2.4 Establishing Visual Sensitivity

- 7.A.2.4.1 The next step in assessing the importance of the likely visual effects will be to determine the sensitivity of the visual receptors to the Project.
- 7.A.2.4.2 Visual receptors are people and their sensitivity ‘is assessed in terms of both their susceptibility to change in views and visual amenity and also the value attached to particular views’. GLVIA3 Page 113, para. 6.31.
- 7.A.2.4.3 As explained above, the value attached to a particular view will be identified as part of the baseline, while the susceptibility of the visual receptor is linked to the Project and the change likely to arise. The effect of that change depends on:
- *“the occupation or activity of people experiencing the view at a particular location; and*
 - *the extent to which their attention or interest may therefore be focused on the view and the visual amenity they experience at particular locations”*. GLVIA3 Page 113, para. 6.33.
- 7.A.2.4.4 Those visual receptors most likely to be more susceptible to change include:
- residents and communities where the view contributes to the landscape setting;

- people engaged in outdoor recreation whose interest is likely to be focused on the landscape; and
- visitors to identified viewing places or heritage assets where the surrounding landscape makes an important contribution to the experience.

7.A.2.4.5 Visual receptors less susceptible to change include users of the transport network and people at work.

7.A.2.4.6 Views will often be experienced by several different receptor types at the same location. For instance, a viewpoint on a footpath immediately adjacent to residential properties will be experienced differently by each receptor type and the different receptor groups will have differing susceptibility to change. In such locations, the overall sensitivity of the receptor is assessed as those with the higher susceptibility.

7.A.2.4.7 The susceptibility of the visual receptors to change will be categorised as **very high**, **high**, **medium**, or **low** by applying the indicators listed in **Table 2.2**. Judgements will be supported by narrative description to explain the conclusions reached.

Table 2.2: Indicators of visual receptor susceptibility

| Category | Indicators |
|-----------|---|
| Very High | <p>People visiting locations purely to experience the view and where there is typically a prolonged viewing opportunity. Examples include:</p> <ul style="list-style-type: none"> • People living and moving around communities where the views are widely recognised as being of the outstanding scenic quality (typically within or to a nationally designated landscape); • People engaged in outdoor recreation where the views are of the highest scenic quality (including views from nationally designated or regionally promoted trails and panoramic viewpoints – often marked on OS plans and providing interpretation facilities); and • Visitors to heritage assets or other tourist and visitor attractions where the views are of the highest scenic quality and make an important contribution to the experience. |
| High | <p>People whose attention or interest is likely to be focused on the view and where there is typically a prolonged viewing opportunity. Examples include:</p> <ul style="list-style-type: none"> • People living and moving around communities where views contribute to the landscape setting enjoyed by residents; • People engaged in outdoor recreation (including public rights of way) whose interest is likely to be focused on the landscape/landscape; • Visitors to heritage assets where views of the surrounding landscape make an important contribution to the experience; and |

| Category | Indicators |
|----------|--|
| | <ul style="list-style-type: none"> • People travelling on scenic and tourist routes, where attention is focused on the surrounding landscape. |
| Medium | <p>People whose attention or interest may partially be on the appreciation of their surroundings. Examples include:</p> <ul style="list-style-type: none"> • People travelling on local roads who may have some interest in their surroundings, but the view is transitory; • People at their place of work whose attention is on their surroundings and where the setting is important to their quality of working life; and • People taking part in outdoor sport or recreation which does not involve appreciation of the view. |
| Low | <p>People whose attention or focus is on other activities, not on their surroundings. Examples include:</p> <ul style="list-style-type: none"> • Travellers on major road or rail routes, which are not scenic or tourist routes and where the view is typically experienced at speed; • People at their place of work whose attention is not on their surroundings and where setting is not important to their quality of working life; and • People taking part in outdoor sport or recreation which does not involve appreciation of the view. |

7.A.2.4.8 Paragraph 6.35 of GLVIA3 notes that,

“These divisions are not black and white and in reality, there will be gradation in susceptibility to change. Each project needs to consider the nature of the groups of people who will be affected and the extent to which their attention is likely to be focused on views and visual amenity”. GLVIA3 Page 114, para. 6.35.

7.A.2.4.9 An overall judgement on the sensitivity of the visual receptors will then be made by combining the judgements about the value attached to the view with the susceptibility of the visual receptors to the changes arising from the Project.

7.A.2.4.10 Care will be taken to ensure that views across the flat fenland and similar open landscapes are given due consideration when judging sensitivity. This because although these landscapes are flat and relatively featureless, these are attractive and valued characteristics.

7.A.2.4.11 The sensitivity of the visual receptors will be categorised as **very high**, **high**, **medium**, or **low**. Judgements will be supported by narrative description linked back to evidence from the baseline study to explain the conclusions reached.

7.A.2.5 Predicting Magnitude of Change

7.A.2.5.1 GLVIA3 (para. 6.27) sets out the criteria which should be considered in reaching a professional judgement on the magnitude of visual change. These include *“its size*

or scale, the geographical extent of the area influenced, and its duration and reversibility". GLVIA3 Page 115, para. 6.38.

Size and Scale of Effect

7.A.2.5.2 The size and scale of a visual change will be assessed as **large, medium, small** or **barely perceptible** depending on:

- the composition of the view with respect to the loss or addition of features in the view, including the nature of the view (full, partial, glimpsed) and the proportion of the view occupied by the Project;
- the distance of the viewpoint from the development and how this affects its prominence;
- the degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour, and texture;
- the presence of landform, buildings or vegetation (including seasonal effects due to variations in deciduous leaf cover) which may wholly or partly obstruct views of the Project, allowing only partial or glimpsed views;
- the duration and nature of the visual effect. This can depend on the speed of travel which affects how long a view will be experienced (continuously, intermittently, glimpsed either once or repeatedly and sequentially along a route) and the possibility that a development will be noticed; and
- the background which the Project is viewed against can affect the degree of contrast and scale. For example, pylons, conductors, and other electricity infrastructure are more difficult to discern when viewed against a textured background than against an open sky background.

7.A.2.5.3 Other considerations, which can influence the magnitude of likely change include the level of activity in a scene, presence of noise or lighting, traffic movement, peoples' likely preferences and expectations, quality of the existing view (inevitably a point of judgement), nature of the scene (open and directionless, or visually contained by enclosing features) and any other elements that affect human perception.

7.A.2.5.4 Visualisations will be prepared to illustrate the existing views from each viewpoint and a selection of viewpoints will be illustrated with photomontage visualisations to provide a photorealistic illustration of the change in views.

Geographical Extent of Effect

7.A.2.5.5 The geographical extent of a visual change records the extent of the area over which the changes will be visible e.g. whether this is a unique viewpoint from where the proposed electricity transmission infrastructure can be glimpsed, or whether it represents a larger area from which similar views are gained. It is also a reflection of whether the view is experienced continuously or intermittently. Geographical extent is described as being **large** (widespread), **medium** or **small** (localised).

Duration and Reversibility

- 7.A.2.5.6 Paragraph 5.51 of GLVIA3 states that duration ‘*can usually be simply judged on a scale such as short term, medium term or long term*’. For the purposes of the assessment, duration will be determined in relation to the phases of the Project, as follows:
- **short term** – assumed to cover construction plus one-year reinstatement;
 - **medium term** – assumed to be 2-15 years post construction and include the effects of permanent vegetation loss on the baseline environment; and
 - **long term** – assumed to be of a duration that extends longer than 15 years post construction once any committed mitigation planting has achieved its design intention.
- 7.A.2.5.7 The duration of the effect will also be described as **temporary, transient** (whether continuous or intermittent) or **seasonal** (views which would be subject to seasonal leaf cover).
- 7.A.2.5.8 In accordance with the principles contained within GLVIA3, reversibility will be reported as **reversible, potentially reversible** or **irreversible** (i.e. permanent), and is related to whether the change can be reversed at the end of the phase of development under consideration (i.e. at the end of construction or at the end of the operational lifespan of the Project).

Making Judgements

- 7.A.2.5.9 Combining the three separate considerations (size/scale of effect, geographical extent of the effect and duration and reversibility) in one rating for magnitude of change can distort the aim of identifying significant effects. For example, an increased magnitude of change, based on size/scale, may be reduced to a lower rating if it occurred in a localised area or for a short duration. This might mean that a potentially significant effect may be overlooked if impacts are moderated down due to their geographical extents and/or duration/reversibility. To counter this, judgements on magnitude will be based on the size/scale of effect and adjusted up or down to reflect the duration of change and whether it is likely to be reversible. A separate description of the geographical distribution of effects across the study area will be provided in the visual assessment summary.
- 7.A.2.5.10 The magnitude of visual change will be categorised as **large, medium, medium, small** or **negligible** by applying the indicators listed in **Table 2.3**. Judgements will be supported by narrative description to explain the conclusions reached.

Table 2.3: Indicators of magnitude of visual change

| Category | Indicators |
|----------|---|
| Large | <p>The Project would be a prominent feature in the view and result in a substantial change to the composition and character of the existing view and how it is perceived.</p> <p>Typically, this would be where the Project would be seen in close proximity. A large proportion of the view would be affected and there would be little backgrounding to reduce the degree of visual contrast.</p> |

| Category | Indicators |
|-----------------|--|
| | The duration/reversibility of effect is likely to be long-term and non-reversible. |
| Medium | <p>The Project would be a conspicuous element in the view and result in a noticeable change to the composition and character of the existing view and how it is perceived.</p> <p>Typically, this would be where the Project would be seen in mid-range views but would still be clearly visible and well-defined. Only part of the view may be affected and there may be some backgrounding to reduce the degree of visual contrast.</p> <p>The duration/reversibility of effect is likely to be long-term, and non-reversible.</p> |
| Small | <p>The Project would form a small part of the view and result in a slight change to the composition and character of the existing view and how it is perceived.</p> <p>Typically, this would be where the Project would be seen in mid-range or distant views but would be indistinct and/or partially obscured. Only a small proportion of the view would be affected and there may be a high level of backgrounding to reduce the degree of visual contrast.</p> <p>The duration/reversibility of effect is likely to be medium-term and potentially reversible.</p> |
| Negligible | <p>The Project would be very indistinct and result in a barely perceptible change to the character and quality of the existing view and how it is perceived.</p> <p>Typically, this would be where a development would form part of a long-distance panoramic view and/or where a very small proportion of the view is affected. There may be a high level of backgrounding to reduce the degree of visual contrast.</p> <p>The duration/reversibility of effect is likely to be short-term and reversible.</p> |

7.A.2.5.11 The assessment will also identify views where no change is anticipated. In these instances, 'no change' is inserted into the appropriate magnitude of effect column and the resulting effect is identified as 'no effect'.

7.A.2.6 Judging Levels of Visual Effect

7.A.2.6.1 The final step in the assessment will be to predict the likely significant visual effects that may arise.

7.A.2.6.2 The methodology adopts the 'overall profile' approach in GLVIA3 whereby, 'all the judgements against the individual criteria can be arranged in a table to provide an overall profile of each identified effect'. GLVIA3 Page 92, para 5.55. This determination requires the application of professional judgement and experience to balance the different variables.

- 7.A.2.6.3 Judgements will be made on a case-by-case basis, guided by the matrix of sensitivity set out in **Volume 1, Chapter 5, EIA Approach and Methodology, Image 5.3**. Significance will be categorised as **major, moderate, minor, or negligible** and the direction of change as **beneficial** or **adverse**. Each of the significance categories will cover a broad range of effects and represents a continuum or sliding scale. Where an effect falls at the upper or lower end of the category, this will be noted and explained.
- 7.A.2.6.4 Paragraph 6.42 of GLVIA3 notes that the significance of visual effects is not absolute and *‘can only be defined in relation to each development and its specific location’*.
- 7.A.2.6.5 Paragraph 6.44 of GLVIA3 notes that:
- *“effects on people who are particularly sensitive to changes in views and visual amenity are more likely to be significant;*
 - *effects on people at recognised and important viewpoints or from recognised scenic routes are more likely to be significant;*
 - *large-scale changes which introduce new, non-characteristic or discordant or intrusive components into the view are more likely to be significant than small changes or changes involving features already present in the view; and*
 - *where assessments of significance place visual effects between these extremes, judgements must be made about whether or not they are significant, with full explanations of why these conclusions have been reached”*.
- 7.A.2.6.6 For each visual receptor, a narrative description explaining the rationale for the conclusion reached regarding the level of the effects, will be provided in the main text.

7.A.2.7 Mitigation and Residual Effects

- 7.A.2.7.1 If the design has been developed iteratively with the assessment process, then mitigation measures may not be necessary as all potentially significant adverse effects, which can be avoided or reduced, may have been designed out.
- 7.A.2.7.2 The most effective mitigation measures are ones which are integral to the scheme. A distinction will therefore be made between measures designed as an intrinsic part of the scheme (primary or embedded measures) and those which are intended to specifically counteract any residual negative effects of the Project (secondary measures).
- 7.A.2.7.3 Significant residual visual effects remaining after proposed mitigation will be summarised as the final step in the assessment process. Significance will be categorised as major, moderate, minor, or negligible and the direction of change as beneficial or adverse.
- 7.A.2.7.4 Each of the significance categories will cover a broad range of effects and represents a continuum or sliding scale. Where an effect falls at the upper or lower end of the category, this will be noted and explained.

7.A.3 RESIDENTIAL VISUAL AMENITY

7.A.3.1 Background

- 7.A.3.1.1 In 2019, the Landscape Institute (LI) published the Residential Visual Amenity Assessment guidance (RVAA guidance)³ (LI, 2019) setting out the background and approach to the assessment of potential effects on residential visual amenity.
- 7.A.3.1.2 Paragraph 1.2 of the RVAA defines residential visual amenity as *“the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage”*. Residential visual amenity is one component of ‘Residential Amenity’ which also includes other components of residential amenity including noise, vibration, air quality, access to daylight, and electromagnetic field etc. and which may otherwise be referred to collectively as ‘living conditions’.
- 7.A.3.1.3 The key difference between RVAA and LVIA is that RVAA focuses on private visual amenity at individual properties whilst LVIA focusses on public amenity and views (although visual effects assessment may sometimes be carried out as part of a residential amenity assessment, in which case this will supplement and form part of the normal LVIA for a project).
- 7.A.3.1.4 GLVIA3 reinforces the RVAA guidance, stating that *“Effects of development on private property are frequently dealt with mainly through residential amenity assessments. These are separate from LVIA although visual effects assessment may sometimes be carried out as part of a residential amenity assessment, in which case this will supplement and form part of the normal LVIA for a project”*. (Para. 6.17).
- 7.A.3.1.5 Changes in views and visual amenity because of development are considered in the planning process. In respect of private views and visual amenity, it is widely accepted that no one has ‘a right to a view’. This includes situations where a residential property’s outlook is judged to be ‘significantly’ affected by a proposed development, a matter which has been confirmed in several appeal/public inquiry decisions.
- 7.A.3.1.6 It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence because of new development being introduced into the landscape. This does not in itself necessarily cause particular planning concern. However, there are situations where the views of a proposed development from a property or its curtilage are judged to be so overbearing or unavoidable that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before.
- 7.A.3.1.7 Paragraph 2.1 of the RVAA guidance introduces an approach to considering a potential ‘Residential Visual Amenity Threshold’, beyond which effects may be of *“such nature and/or magnitude that it potentially affects ‘living conditions’ or*

³ The Landscape Institute (February 2019) Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA)

residential amenity". Determining whether the threshold has been reached requires informed professional judgement.

- 7.A.3.1.8 LVIA findings of significant (adverse) visual effects at a residential property do not automatically imply the need for a RVAA. However, for properties close to a development proposal, and which experience a high magnitude of visual change and major adverse effect, an RVAA may be appropriate to establish whether the Residential Visual Amenity Threshold is likely to be, or has been, reached.
- 7.A.3.1.9 The RVAA guidance recommends a four-step approach which draws heavily on the GLVIA3 principles and process. The first three steps of the approach "*fall broadly within the normal scope of LVIA consisting of an assessment of the magnitude and significance of visual effect (in the EIA context) and change to visual amenity likely to be experienced by occupants at those individual residential properties which were identified*" (Para. 3.2). The fourth step "*requires a further assessment of change to visual amenity examining whether the Residential Visual Amenity Threshold is likely to be, or has been, reached. Whether or not this final step is engaged depends on the circumstances specific to the case*". (Para. 3.3).
- 7.A.3.1.10 The following text summarises the four steps and how they will be applied to the Project.

Step 1: Definition of Study Area and Scope of the Assessment

- 7.A.3.1.11 In accordance with the key principles of the Holford Rules, avoiding settlements and residential properties is a key consideration of the routeing process for the Project in order to avoid or minimise the potential for significant effects on the views and visual amenity of residential receptors.
- 7.A.3.1.12 The detailed routeing process will make every effort to maintain a minimum distance of 150 m between a residential property and the Project. In addition, the routeing process will seek to avoid introducing pylons into the key/principal views from residential properties. This will be informed by observations made during field work which will consider the orientation of properties, the likely availability of views from the property and its curtilage and the presence of intervening screening features (e.g. localised landform, woodland, forestry and vegetation, buildings and other landscape features). Nevertheless, given the nature of the development, the potential is likely to remain for significant visual effects in relation to views and visual amenity, experienced from residential properties near the Project.
- 7.A.3.1.13 To determine whether more detailed consideration of effects on views and visual amenity from residential properties is required in the form of an RVAA, any property where occupants are likely to experience significant adverse effects will be included in the assessment.
- 7.A.3.1.14 Properties will be assessed individually, but if their outlook and/or views are in all aspects the same (for example if a development is visible from the rear gardens only of a small row of houses) they will potentially be assessed as one group. This will be at the discretion of the assessor and will be supported by a clear explanation of the reason for the grouping or clustering.

Step 2: Evaluation of Baseline Visual Amenity and Receptor Sensitivity

- 7.A.3.1.15 As outlined in paragraph 4.23 of the RVAA guidance, residents at home are considered of high susceptibility to changes in their view whether from the property itself, its curtilage or its access.
- 7.A.3.1.16 GLVIA3 states that *“in the assessment of visual effects it will be important to recognise that residents may be particularly susceptible to changes in their visual amenity - residents at home, especially using rooms normally occupied in waking or daylight hours, are likely to experience views for longer than those briefly passing through an area”*. (Para. 6.36).
- 7.A.3.1.17 Whilst an appreciation of the surrounding views is often material to the quality of life experienced by residents and therefore the value of their private views is typically considered by residents to be high, this is not always the case. Professional judgment will be applied to describe the views experienced in terms of their nature, extent, and quality. This will include the direction of the view, the orientation of buildings, location of garden or curtilage areas access and the presence of intervening features such as vegetation, with the seasonality of vegetation screening and potential changes to forestry being referred to where applicable. The presence of other existing transmission infrastructure, or other infrastructure will also be noted.
- 7.A.3.1.18 Taking account of the high susceptibility of receptors and assuming that the value of the views is high, the overall sensitivity of residential receptors is typically judged to be high.

Step 3: Assessment of Likely Change to Visual Amenity Experienced by Residents

- 7.A.3.1.19 The third step in the process will assess the magnitude and significance of likely visual effect at each property. Effects will be examined in accordance with GLVIA3 principles and processes, considering the sensitivity of the receptor (comprising ‘value’ and ‘susceptibility’) with the likely magnitude of change.
- 7.A.3.1.20 The aim of Step 3 will be to identify those properties requiring further assessment in Step 4 in relation to the Residential Visual Amenity Threshold judgement.
- 7.A.3.1.21 Considerations set out in the RVAA guidance which provide a framework for describing and evaluating the predicted magnitude of visual change and related visual amenity effects which may lead to the property being considered in Step 4 include:
- *“distance of property from the proposed development having regard to its size scale and location relative to the property (e.g. on higher or lower ground);*
 - *type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be affected, having regard to seasonal and diurnal variations;*
 - *direction of view/aspect of property affected, having regard to both the main/primary and peripheral/secondary views from the property;*
 - *extent to which development/landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the*

domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;

- *scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;*
- *degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;*
- *duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc.; and*
- *mitigation opportunities – consider implications of both embedded and potential further mitigation”. (Para 4.14)*

7.A.3.1.22 This step will typically involve both desk study and detailed fieldwork but is unlikely to require visits to individual properties which, for the purposes of this step, can generally be assessed from the nearest publicly available vantage/access point. Where this is not feasible then visits to certain individual properties (or clusters of) may be appropriate.

7.A.3.1.23 Step 3 concludes by identifying which properties should be assessed further in the final step in order to reach a judgement regarding the Residential Visual Amenity Threshold.

Step 4: Forming the Residential Visual Amenity Judgement

7.A.3.1.24 The final step of RVAA will involve a more detailed examination of the predicted effects on the visual amenity at those properties identified for further assessment in the previous step. There is an important distinction between this concluding step of RVAA and the preceding one.

7.A.3.1.25 In Step 3 the assessment will reach a conclusion with respect to magnitude and (EIA) significance of visual effect, and the change in visual amenity at the property. In this final step, properties which are predicted to experience the largest magnitude of visual effect will be subject to a further judgement associated with the Residential Visual Amenity Threshold.

7.A.3.1.26 As detailed in the RVAA Guidance, *“This concluding judgement should advise the decision maker whether the predicted effects on visual amenity and views at the property are such that it has reached the Residential Visual Amenity Threshold, therefore potentially becoming a matter of Residential Amenity. This judgement should be explained in narrative setting out why the effects are considered to reach the Residential Visual Amenity Threshold. Equally, judgements should explain why the threshold has not been reached”.* (Para. 4.18).

7.A.3.1.27 The key point regarding Step 4 is that the judgement required in this final, concluding step *“goes beyond the assessment undertaken in Step 3 which is restricted to judging the magnitude and significance of visual effect, typically as a supplement to the accompanying LVIA”.* (Para. 4.20). If effects identified within the LVIA and/or CLVIA undertaken during Step 3, and in accordance with GLVIA3 principles and processes, require further consideration, Step 4 will be undertaken in accordance with the approach advocated within the RVAA Guidance.

7.A.4 Technical Information

7.A.4.1 Baseline Photography

General Site Photography

- 7.A.4.1.1 Baseline photographs will be taken using a Canon EOS digital SLR with a full frame sensor (36 x 24 mm) using a 50 mm equivalent fixed focal length lens. Photographs are taken in accordance with best practice guidance, including the Landscape Institute's 'Visual Representation of Development Proposals' Technical Guidance Note 06/19 (LI TGN 06/19), and their location recorded using an on-site handheld GPS (Type 3 LI TGN 06/19). Where required, the resulting images will be stitched together using specialist PTGui software to create 90° panoramic baseline views. The time at which the photographs are taken, and the prevailing weather conditions, will be recorded for each viewpoint. For general site photography, 360° panoramas will be taken unless there are privacy issues in relation to nearby properties.
- 7.A.4.1.2 Photographs will be undertaken in winter and in clear lighting conditions.

Photography for Photomontage

- 7.A.4.1.3 Baseline photography may be required for the production of photomontages to accurately represent the Project. This type of photography will require a higher level of accuracy and will be subject to additional survey methods in line with LI TGN 06/19. A full methodology for the photography for photomontage (Type 4 LI TGN 06/19) and the photomontage process will be submitted with any photomontages produced during statutory consultation or form part of the formal application.

7.A.4.2 Wireframes

- 7.A.4.2.1 Wireframe diagrams (Type 2 LI TGN 06/19) will be prepared showing the outline of the Project. These are computer-generated line drawings, based on the digital terrain model combined with information about the location and scale of components of the project, to give a relatively simple indication of how the Project would appear from different viewpoints. Wireframe diagrams will be produced for all viewpoints in order to assist the assessment process.
- 7.A.4.2.2 For each viewpoint, wireframe renders will be generated using software called TrueViewVisuals. These are based on a digital terrain dataset (Ordnance Survey (OS) Terrain 50) using a model of the project to provide an accurate depiction of the appearance of the Project.
- 7.A.4.2.3 The wireframes will represent the maximum theoretical visibility of the development on bare ground (i.e. assuming no vegetation, buildings or other vertical structures are present to provide any screening). In reality, the visibility also depends on both the weather and the lighting conditions. The existing 400 kV overhead lines to be retained will also be included on the baseline wireframes for comparison against the wireframes of the Project.

7.A.4.3 Zone of Theoretical Visibility

- 7.A.4.3.1 A ZTV map will be prepared to help identify the potential visibility of the new 400 kV overhead line. It will also help to refine the study area and support the assessment of effects. ZTVs will also be prepared for the existing 400 kV overhead lines and for the two taller pylons at the River Ouse crossing.
- 7.A.4.3.2 The ZTV will indicate the theoretical visibility of the pylons. In some locations, extensive vegetation cover will mean the actual extent of visibility is substantially less than that shown in the ZTV, and professional judgement will be used to further refine the study area to focus on likely significant effects.
- 7.A.4.3.3 The ZTVs will be based on the most recently available topographic data. A datum of 1.6 m above ground level will be used to represent the eye level view of an average height person. The validity of the ZTV will be checked on site, using professional judgement, to ensure the output is a fair representation of the theoretical visibility of the Project, in line with guidance provided by the Landscape Institute.
- 7.A.4.3.4 The ZTV will take account of the following factors:
- the existing topography using OS terrain 50 data;
 - existing buildings by applying a 7 m average height to the OS Mastermap layer; and
 - existing woodland cover by applying a 15 m average height to the National Forest Inventory which is produced by the Forestry Commission and records all forests and woodlands with an area of 0.5 ha and over.
- 7.A.4.3.5 Individual and small groups of trees will be excluded as, during winter, these will provide only minimal screening.

7.A.4.4 Assumptions and Limitations

- 7.A.4.4.1 The visual assessment will be based on professional judgement and will consider both the adverse and beneficial effects that the Project may have on the visual amenity of receptors.
- 7.A.4.4.2 All baseline surveys will be carried out on publicly accessible land and in accordance with industry accepted guidance. In instances where site access is not available from publicly accessible land, professional judgement will be used to approximate and record the likely views and visual effects from these locations.
- 7.A.4.4.3 It is not proposed to prepare a ZTV for the construction phase of the Project as there is a great degree of variability in the extent and timeframes of visibility of construction activity. Also, tall construction plant (for example tower cranes and piling rigs) rarely gives rise to significant landscape and visual effects as it is present at each pylon location for a short period of time. Tall construction plant will, however, be taken into account in the assessment of construction effects on visual receptors.

7.A.5 References

- Ref 7.A.1 National Grid; Holford Rules
(<https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf>)
- Ref 7.A.2 National Grid; Horlock Rules
(<https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf>)
- Ref 7.A.3 Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3)
- Ref 7.A.4 Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals
- Ref 7.A.5 Landscape Institute (2019) Technical Guidance Note 02/19 Residential Visual Amenity Assessment
- Ref 7.A.6 National Grid (2012) Our Approach to the Design and Routeing of New Electricity Transmission Lines
- Ref 7.A.7 Planning Inspectorate (2015) Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (AN17)

8.A Designated Sites - Ecology and Biodiversity

8.A.1 Designated Sites – Ecology and Biodiversity

Table 8.A.1.1 Statutorily Designated Sites

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
|--------------------|--|--|
| Humber Estuary SAC | <p>Annex I habitats¹ that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Estuaries; and • Mudflats and sandflats not covered by seawater at low tide. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time; • Coastal lagoons (*priority feature); • Salicornia and other annuals colonizing mud and sand; • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>); • Embryonic shifting dune; • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (“white dunes”); • Fixed coastal dunes with herbaceous vegetation (“grey dunes”) (“Priority feature”); and • Dunes with <i>Hippopha rhamnoides</i>. <p>Annex II species¹ present as a qualifying feature, but not a primary reason for site selection:</p> | Present within Scoping Boundary |

¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. EC, Brussels

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
|--------------------|---|--|
| Humber Estuary SPA | <ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>); • River lamprey (<i>Lamprey fluviatilis</i>); and • Grey seal (<i>Halichoerus grypus</i>). <p>The site comprises extensive wetland and coastal habitats.</p> <p>The site qualifies under Article 4.1² by regularly supporting the following Annex 1 species in any season:</p> <ul style="list-style-type: none"> • Avocet (<i>Recurvirostra avosetta</i>) (wintering and breeding); • Bittern (<i>Botaurus stellaris</i>) (wintering and breeding); • Hen harrier (<i>Circus cyaneus</i>) (wintering); • Golden plover (<i>Pluvialis apricaria</i>) (wintering); • Bar-tailed godwit (<i>Limosa lapponica</i>) (wintering); • Ruff (<i>Calidris pugnax</i>) (passage); • Marsh harrier (<i>Circus aeruginosus</i>) (breeding); and • Little tern (<i>Sternula albifrons</i>) (breeding). <p>The site qualifies under article 4.2 of the Directive (79/409/EEC)² as it is used regularly by the following regularly occurring migratory species other than those listed in Annex I) in any season:</p> <ul style="list-style-type: none"> • Shelduck (<i>Tadorna tadorna</i>) (wintering); • Knot (<i>Calidris canutus</i>) (wintering and passage); • Dunlin (<i>Calidris alpina</i>) (wintering and passage); • Black-tailed godwit (<i>Limosa limosa</i>) (wintering and passage); and • Redshank (<i>Tringa tetanus</i>) (wintering and passage). | Present within Scoping Boundary |

² European Commission (EC) (2009). Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version). EC, Brussels.

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
|-----------------------|--|--|
| | <p>Assemblage qualification: The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:</p> <p>Dark-bellied brent goose (<i>Branta bernicla bernicla</i>), shelduck, wigeon (<i>Anas Penelope</i>), teal (<i>Anas crecca</i>), mallard (<i>Anas platyrhynchos</i>), pochard (<i>Aythya ferina</i>), scaup (<i>Aythya marila</i>), goldeneye (<i>Bucephala clangula</i>), bittern, oystercatcher (<i>Haematopus ostralegus</i>), avocet, ringed plover (<i>Charadrius hiaticula</i>), golden plover, grey plover (<i>Pluvialis squatarola</i>), lapwing (<i>Vanellus vanellus</i>), knot, sanderling (<i>Calidris alba</i>), dunlin, ruff, black-tailed godwit, bar-tailed godwit, whimbrel (<i>Numenius phaeopus</i>), curlew (<i>Numenius arquata</i>), redshank, greenshank (<i>Tringa nebularia</i>) and turnstone (<i>Arenaria interpres</i>).</p> | |
| Humber Estuary Ramsar | <p>The site is designated for:</p> <p>Ramsar Criterion 1: The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons.</p> <p>Ramsar Criterion 3: The Humber Estuary Ramsar site supports a breeding colony of grey seals at Donna Nook. Dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad (<i>Bufo calamita</i>).</p> <p>Ramsar Criterion 5: Assemblages of international importance – non-breeding season: 153,934 waterfowl, non-breeding season (5-year peak mean 1996/97-2000/2001)</p> | Present within Scoping Boundary |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
|-------------------------------|---|--|
| | <p>Ramsar Criterion 6: Species/populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> • Golden plover (passage and wintering); • Red knot (passage and wintering); • Dunlin (passage and wintering); • Black-tailed godwit (passage and wintering); • Redshank (passage and wintering); • Shelduck (wintering); and • Bar-tailed godwit (wintering). <p>Ramsar Criterion 8: The Humber Estuary acts as an important migration route for both river lamprey and sea lamprey between coastal waters and their spawning areas.</p> | |
| Thorne and Hatfield Moors SPA | Thorne and Hatfield Moors SPA is of European importance because the site is used regularly by 1.9% of the Great Britain population of Annex 1 species Nightjar (<i>Caprimulgus europaeus</i>). | 2.99 km west |
| Thorne Moor SAC | The Annex I habitat that is a primary reason for selection of this site is degraded raised bogs still capable of natural regeneration. | 2.99 km west |
| Hatfield Moor SAC | The Annex I habitat that is a primary reason for selection of this site is degraded raised bogs still capable of natural regeneration. | 5.75 km west |
| Lower Derwent Valley SPA | <p>The site qualifies by supporting internationally important numbers of species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/4/EEC:</p> <ul style="list-style-type: none"> • Breeding shoveler (<i>Spatula clypeata</i>); • Wintering teal; • Wintering wigeon (<i>Mareca penelope</i>) • Wintering Bewick's swan (<i>Cygnus columbianus</i>); and | 14.44 km north-west |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
|-----------------------|--|--|
| | <ul style="list-style-type: none"> • Wintering ruff. • Golden plover <p>Under Article 4.2 of Directive 79/409/EEC the site supports an internationally important assemblage of birds over winter numbering 40,616 waterfowl, including; Bewick's swan, wigeon, teal, golden plover and ruff.</p> | |
| Brantingham Dale SSSI | The SSSI is primarily designed for calcareous grassland. The site supports a mosaic of species-rich chalk grassland amid extensive areas of scrub invasion and young woodland. | Present within Scoping Boundary |
| Humber Estuary SSSI | <p>The SSSI is designated for a series of nationally important habitats. These are the estuary itself (with its component habitats of intertidal mudflats and sandflats and coastal saltmarsh) and the associated saline lagoons, sand dunes and standing waters. The site is also of national importance for the geological interest at South Ferriby Cliff (Late Pleistocene sediments) and for the coastal geomorphology of Spurn. The estuary supports nationally important numbers of 22 wintering waterfowl and nine passage waders, and a nationally important assemblage of breeding birds of lowland open waters and their margins. It is also nationally important for a breeding colony of grey seals, river lamprey and sea lamprey, a vascular plant assemblage and an invertebrate assemblage.</p> <p>The estuary regularly supports 22 species of wintering waterfowl in nationally important numbers. These are bittern, dark-bellied brent goose, shelduck, wigeon, teal, pochard, scaup, goldeneye, oystercatcher, avocet, ringed plover, golden plover, grey plover, lapwing, knot, sanderling, dunlin, black-tailed godwit, bar-tailed godwit, curlew, redshank and turnstone. In addition, nine species of passage waders regularly occur in nationally important numbers on the Humber Estuary. These are: ringed plover, grey plover, sanderling, dunlin, ruff, black-tailed godwit, whimbrel, redshank and greenshank.</p> | Present within Scoping Boundary |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
|------------------------------|--|--|
| | The Humber Estuary supports a breeding bird assemblage of lowland open waters and their margins, including nationally important numbers of bittern, marsh harrier (e), avocet and bearded tit (<i>Panurus biarmicus</i>). | |
| Chesterfield Canal SSSI | This site, a 20 km stretch of canal between Retford and Misterton in north Nottinghamshire, supports a nationally uncommon aquatic plant community characteristic of the brackish, eutrophic (nutrient-rich) water. The flora includes a number of nationally scarce species. The presence of this brackish water community, over 50 km inland, is of particular interest. | Present within Scoping Boundary |
| Crowle Borrow Pits SSSI | Crowle Borrow Pits lie either side of the embankment of a disused railway line and include a variety of habitats. The main habitats are acid grassland, broadleaved, mixed and yew woodland and fen, marsh and swamp. Several locally uncommon plant species occur at the site. | 0.07 km south-west |
| Treswell Wood SSSI | The site comprises one of the best examples of an ash-oak-maple wood in Nottinghamshire and is representative of ancient semi-natural woodland on heavy clay soils in Eastern and Central England. Additional interest is provided by the presence of woodland rides, watercourses and ponds and by the varied breeding bird community. | 0.09 km north-west |
| Eastoft Meadow SSSI | Eastoft Meadow is a small herb-rich hay meadow (lowland neutral grassland) on shallow alluvial soil over-lying Keuper Marl. Of particular note is the occurrence of green-winged orchid (<i>Anacamptis morio</i>), burnt-tip orchid (<i>O. ustulate</i>) and adder's-tongue fern (<i>Ophioglossum vulgatum</i>), species which have declined markedly in eastern England with the ploughing out of old grasslands. The botanical interest of the site is dependent on the maintenance of traditional management by hay cropping without the addition of artificial fertilisers. | 0.19 km west |
| Mother Drain, Misterton SSSI | A drainage channel running parallel to the River Idle on the edge of the North Nottinghamshire Carr Lands. The site supports an exceptionally rich invertebrate fauna, which includes notable assemblages of dragonflies and water beetles (<i>Coleoptera</i>), and a rare moth. Open water communities of common aquatic plants occupy the central bed | 0.28 km south-east |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
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| | of the channel. These are flanked by stands of robust emergent species. sand leek (<i>Allium scorodoprasum</i>) occurs here in its only Nottinghamshire locality. | |
| Clarborough Tunnel SSSI | The site comprises one of the best examples of calcareous grassland in Nottinghamshire and is representative of grassland swards developed on calcareous clay soils in Central and Eastern England. | 0.32 km west |
| Hewson's Field SSSI | Hewson's Field represents one of the few remaining fragments of neutral unimproved grassland in the intensively farmed landscape of South Humberside. The field has been managed traditionally for hay and pasturage. | 0.35 km north-west |
| Haxey Grange Fen SSSI | Haxey Grange Fen is principally a fen site with complementary areas of unimproved neutral grassland, willow scrub and woodland. It is the best example of primary fen habitat known in South Humberside and is particularly important for its invertebrate communities. The site lies on the flat carr land of the River Idle valley and is divided by a system of internal ditches. | 0.46km north-west |
| Hatfield Chase Ditches SSSI | Hatfield Chase is a large area of former marsh and wetland at the head of the Humber Estuary. The land has been extensively drained for agriculture and is now split by a complex network of ditches. The ditches contain a rich assemblage of aquatic and emergent plants, typical of nutrient rich systems. <i>Donacia clavipes</i> and <i>D. simplex</i> are nationally scarce reed beetles that have been recored at the site and the ditches also support a population of water vole (<i>Arvicola terrestris</i>). | 0.59 km south-west |
| Ashton's Meadow SSSI | The SSSI contains the best example of a species-rich neutral grassland in East Nottinghamshire. The field is noted for its quantity of green-winged orchids. | 0.79 km east |
| Rush Furlong SSSI | The SSSI contains lowland neutral grassland in the form of strip of hay meadow on base-rich Keuper Marl soils. | 1.1 km west |
| River Idle Washlands SSSI | The site combines the best remaining washland grasslands (lowland neutral grassland) along the River Idle floodplain. The washlands are important as feeding and roosting sites for populations of wintering and passage waterfowl including Bewick's swans, | 1.97 km west |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
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| | whooper swans (<i>Cygnus cygnus</i>) and mute swans (<i>Cygnus olor</i>), wigeon, teal, pochard, snipe (<i>Gallinago Gallinago</i>) and a variety of other wildfowl and wading birds. Additional interest is provided by the breeding bird community which includes snipe and redshank. | |
| Castle Hill Wood SSSI | The SSSI supports lowland broadleaved, mixed and yew woodland. This includes: W10 - <i>Quercus robur</i> - <i>Pteridium aquilinum</i> - <i>Rubus fruticosus</i> woodland and W8 - <i>Fraxinus excelsior</i> - <i>Acer campestre</i> - <i>Mercurialis perennis</i> woodland. | 2.01 km west |
| Mission Training Area SSSI | Mission Training Area is a redundant military bombing range, forming one of the largest remaining tracts of fenland formerly typical of the Mission/Idle Levels of north Nottinghamshire and Lincolnshire. It supports a diverse range of semi-natural habitats, including standing open water, tall-herb fen, unimproved neutral and acidic grassland, dry oak woodland and nationally restricted wet woodland types. The site is recognised as supporting a rich invertebrate fauna, in particular its assemblage of moths. The breeding bird community associated with birch and willow carr is notable and includes grasshopper warbler (<i>Locustella naevia</i>), long-eared owl and tree pipit (<i>Anthus trivialis</i>), while animals such as grass snake (<i>Natrix helvetica</i>) and great crested newt (<i>Triturus cristatus</i>), with a restricted distribution in Nottinghamshire, occur on the site. | 2.17 km west |
| Mission Line Bank SSSI | The site contains some of the best remaining examples of eutrophic open water, marsh and base-poor fen communities in Nottinghamshire. | 2.25 km west |
| Belshaw SSSI | Belshaw comprises a short length of land along a disused railway line which is important because it supports a colony of greater yellow-rattle (<i>Rhinanthus angustifolius</i>). This nationally rare plant receives special protection under Schedule 8 of the WCA 1981. Once widely distributed, this species is now known to occur at only six localities in Great Britain. | 2.34 km west |
| Drewton Lane Pits SSSI | This site is notified for its international geological interest, the nationally important populations of great crested newts and outstanding assemblage of breeding amphibians. | 2.48 km north-west |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
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| Hotham Meadow SSSI | The SSSI is particularly important for its herb-rich neutral grassland and is one of the best examples of this grassland type in the District of Boothferry, outside the Derwent Valley. | 2.48 km north-west |
| Everthorpe Quarry SSSI | Designated for geological interest. | 2.49 km north-west |
| Melton Bottom Chalk Pit SSSI | Designated for geological interest. | 2.83 km south |
| Thorne, Crowle and Goole Moors SSSI | These moors form the largest extent of lowland raised mire in England, even though much modified by peat cutting. The main habitats comprise lowland bogs, lowland woodland and lowland neutral grassland. Thorne, Crowle and Goole Moors are highly regarded for their invertebrate fauna including several nationally rare as well as local insects such as the bog bush cricket (<i>Metrioptera brachiptera</i>), the scarce vapourer moth (<i>Orgyia recens</i>), the bug (<i>Globiceps Woodreftei</i>), and the beetle (<i>Bembidion humerale</i>). There is also a strong population of large heath butterfly (<i>Coenonympha tullia</i>). The breeding population of nightjars on the Moors is of national importance as its numbers regularly exceed 1% of the total British breeding population. | 2.99 km west |
| Gamston and Easton Woods and Roadside Verges SSSI | The site comprises one of the best examples of an ash-oak-maple wood in Nottinghamshire and is representative of semi-natural woodland developed on clay soils in Central and Eastern England. It is complemented by species-rich roadside verges. These verges constitute a valuable breeding and feeding area for a variety of butterflies and other insects. Additional interest is provided by the variety of the breeding bird community which utilises the site. | 3.00 km west |
| Spalford Warren SSSI | The site comprises the best remaining example of grass heath dominated by wavy hair-grass (<i>Deschampsia flexuosa</i>) and sand sedge (<i>Carex arenaria</i>) in Nottinghamshire and is one of the few sites of this type to be found in the Midlands. | 3.07 km south-east |
| Haxey Turbary SSSI | The site is a relict bog which was formerly extensively dug for peat. It is now largely colonised by birch woodland, with areas of open wet heathland. The site is particularly | 3.39 km north |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
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| | valued for the occurrence of saw-sedge (<i>Cladium mariscus</i>) and royal fern (<i>Osmunda regalis</i>). | |
| Epworth Turbary SSSI | An area of relict peat vegetation in the low-lying carr land west of the Isle of Axholme, one of only three such areas known to remain in South Humberside. The plant communities represented are birch (<i>Betula spp.</i>) woodland, heathland and fen. | 3.44 km west |
| Burton Bushes SSSI | This oak <i>Quercus</i> spp. woodland is known to exceed 200 years in age, and evidence suggests that it is of natural origins. It is considered a good example of the woodland characteristic of Holderness Till soils. The undisturbed nature of the soil profile is an important feature of the site. | 3.54km north-west |
| Lea Marsh SSSI | An important area of unimproved floodplain meadow and wet pasture adjacent to the River Trent in north-west Lincolnshire. The site lies on seasonally inundated alluvial soils and includes an unusually large area of a nationally rare grassland type. Of particular note is the presence of a large population of narrow-leaved water-dropwort (<i>Oenanthe silaifolia</i>), a nationally scarce plant of very restricted distribution in the East Midlands, and the nationally scarce mousetail (<i>Myosurus minimus</i>). Breeding waders provide additional interest, snipe and curlew occasionally breed on the site at one of their few localities in the county and water vole has been recorded from the perimeter ditches. | 3.71 km east |
| Laughton Common SSSI | Laughton Common supports an extensive and diverse range of vegetation communities characteristic of the north Lincolnshire Coversands, including nationally notable areas of lowland acid grassland, inland dune grassland and lowland heath which are scarce in the county and restricted in their distribution across England. | 3.75 km east |
| Tuetoos Hills SSSI | Tuetoos Hills support an important mosaic of dry acid grassland vegetation including an inland example of acid dune grassland dominated by sand sedge. This type of vegetation, formerly characteristic of active inland dunes of the north Lincolnshire Coversands, is now rare in Lincolnshire and very restricted in its distribution nationally. | 4.19 km east |
| Wyedale SSSI | Wyedale comprises a small chalk dale incised in the western edge of the Yorkshire Wolds and supports lowland calcareous grassland. Both the north and south-facing slopes remain uncultivated and support a rich flora, being invaded by hawthorn scrub | 4.34 km north-west |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
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| | due to lack of grazing. The dale slopes support large populations of Pyramidal (<i>Anacamptis pyramidalis</i>) common spotted (<i>Dactylorhiza fuchsii</i>) and twayblade (<i>Listera ovata</i>) orchids. Such orchid-rich grassland is very unusual on the northern chalk. | |
| Sutton and Lound Gravel Pits SSSI | The site contains extensive areas of open water and margins which support an exceptionally rich assemblage of breeding wetland birds and a nationally important population of wintering gadwall (<i>Mareca strepera</i>). The site supports an exceptional diversity of breeding, wintering and passage birds. | 4.79 km south-west |
| Hatfield Moors SSSI | Designated for: Aggregations of breeding birds – nightjar; and Assemblages of breeding birds – mixed: lowland damp grassland, scrub, woodland. | 5.75 km west |
| Humberhead Peatlands NNR | A wide range of habitats supports the 5,000 species of flora and fauna that have been recorded on the reserve of which more than 4,000 are insects. There are also sizable populations of adder (<i>Vipera berus</i>), water vole and red deer (<i>Cervus elaphus</i>) on the reserve. More than 200 bird species have been recorded and approximately 75 have bred. Winter visitors include whooper swans, pink-footed geese (<i>Anser brachyrhynchus</i>), hen harrier, and short-eared owls (<i>Asio Flammeus</i>). From March-July a summer visitor is the diminutive woodlark (<i>Lullula arborea</i>) and also oystercatcher, lapwing, ringed plover and great crested grebe (<i>Podiceps Cristatus</i>) can be spotted around the lakes. Marsh harrier can usually be seen drifting low over reedbeds and marsh on Thorne Moor. | 3 km west |
| Beverley Parks LNR | The LNR includes an orchard, a small wood and two fields which are being restored to a traditional parkland landscape. The orchard is one of the largest, non-commercial orchards of northern varieties of apples in England. | 0.63 km north-east |
| Owston Ferry Castle LNR | Meadow habitat which supports assemblages of both birds and invertebrates. | 0.81 km east |
| Axholme Line LNR | Supports neutral calcareous grassland. | 1.78 km north-west |

| Designated site | Reason for designation | Approximate distance from Scoping Boundary |
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| Phoenix LNR | Acid grassland, open mosaic habitats and important insects of brownfield land. | 3.61 km south-east |
| Owlet LNR | Birch, oak and pine areas are interspersed among more open heath, scattered throughout the area are mature oak trees. Remnant heath vegetation occurs on more open areas which supports butterflies such as brimstone (<i>Gonepteryx rhamni</i>), small copper (<i>Lycaena phlaeas</i>) and purple hairstreak (<i>Neozephyrus quercus</i>). | 4.09 km south-east |
| Phoenix Parkway LNR | A woodland on acid grassland, with typical acid grassland ground flora species. An important habitat linking Atkinson's Warren to Flixborough. Known to provide habitat to deer, bats, and numerous species of birds and invertebrates. | 4.14 km south-east |
| Conesby Quarry LNR | The site supports a variety of flora and fauna, including orchids, acid loving flowers and plants, butterflies, dragonflies, amphibians and a variety of birds and mammals. | 4.34 km east |
| Atkinson's Warren LNR | Acid grassland with heathland, scrub and mixed woodland habitats. Supports breeding bird species including green woodpecker (<i>Picus viridis</i>), blackcap (<i>Sylvia atricapilla</i>) and linnet (<i>Linaria cannabina</i>). Also provides habitat for invertebrates, birds and mammals. | 4.54 km south-east |

Table 8.A.1.2 Non-statutory designated sites

| Designated site | County/district | Reason for designation | Approximate distance from Scoping Boundary |
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| RSPB Sites | | | |
| RSPB Blacktoft Sands | East Yorkshire and North Lincolnshire | Populations of waders, warblers, raptors owls and breeding bittern. Partially overlapping the Humber Estuary Ramsar, SPA and SSSI designations. | Within the Scoping Boundary |
| RSPB Beckingham Marshes | Nottinghamshire/ Bassetlaw District | A partnership project between RSPB, Environment Agency and a local grazier to create a wet grassland and hay meadow reserve in the Trent Valley. Supports breeding birds including waders and several species of passerine bird including tree sparrow and yellowhammer plus a range of mammals, wildflowers, aquatic plants and invertebrates. | 1.63 km from the Scoping Boundary |
| North and East Yorkshire LWS's | | | |
| Oxmaryke Washlands LWS | North and East Yorkshire | Mosaic of semi-natural habitats including lowland fen, grassland and wetland. | Within the Scoping Boundary |
| Broomfleet Washlands LWS | North and East Yorkshire | Mosaic of semi-natural habitats including lowland fen, grassland and wetland. | Within the Scoping Boundary |
| Broomfleet Pits LWS | North and East Yorkshire | Good quality rich-fen and nutrient-rich standing water site. | Within the Scoping Boundary |
| Drove Road Candidate LWS | North and East Yorkshire | Semi-natural broadleaved woodland. | Within the Scoping Boundary |
| Birkhill Wood LWS | North and East Yorkshire | Ancient semi-natural woodland with evidence of features to support this. | Within the Scoping Boundary |
| Jillywood Lane LWS | North and East Yorkshire | Good quality hedgerow, medieval boundary and ancient woodland boundary. | Within the Scoping Boundary |

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| Cliffs Plantation Candidate LWS | North and East Yorkshire | Semi-natural broadleaved woodland. | Within the Scoping Boundary |
| Woodhill Path, Cottingham LWS | North and East Yorkshire | Good quality hedgerow with 6 woody species per 30 m sample. | 200 m from the Scoping Boundary |
| Risby Park LWS | North and East Yorkshire | Mosaic of semi-natural habitats including woodland and grassland. | 340 m from the Scoping Boundary |
| Eppleworth Wood LWS | North and East Yorkshire | Ancient semi-natural woodland. | 450 m from the Scoping Boundary |
| Mount Airy Verge Candidate LWS | North and East Yorkshire | Good quality semi-improved grassland. | 480 m from the Scoping Boundary |
| Bentley Moor Wood LWS | North and East Yorkshire | Ancient semi-natural woodland. | 670m from the Scoping Boundary |
| Mill Beck and Fields LWS | North and East Yorkshire | Old, established semi-natural neutral grassland. | 670m from the Scoping Boundary |
| Raywell House LWS | North and East Yorkshire | Field evidence of features of ancient or long-standing neutral to calcareous woodland. | 800 m from the Scoping Boundary |
| Moor Lane LWS | North and East Yorkshire | Good quality hedgerow with 6 woody species per 30 m sample. | 1.3 km from the Scoping Boundary |
| Little Wold Plantation LWS | North and East Yorkshire | Semi-natural woodland or scrub that is assigned to W8 NVC Community. | 1.34 km from the Site Scoping Boundary |
| Disused Railway and The Warrens, Weedley Dale Candidate LWS | North and East Yorkshire | Calcareous grassland. | 1.35 km from the Scoping Boundary |
| Fishpond Wood, Risby Estate LWS | North and East Yorkshire | Mosaic of semi-natural habitats including woodland and wetland that also supports field evidence of features of ancient or long-standing acid woodland. | 135 m from the Scoping Boundary |

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| Nut Wood and Wauldby Scroggs LWS | North and East Yorkshire | Semi-natural woodland or scrub that is assigned to W8 NVC Community and supports field evidence of features of ancient or long-standing neutral to calcareous woodland. | 1.44 km from the Scoping Boundary |
| Elloughton Dale East LWS | North and East Yorkshire | Semi-natural woodland that scores within 20% of woodland thresholds and lies within 500 m of an existing statutory site or LWS. | 1.6 km from Scoping Boundary |
| Watery Plump LWS | North and East Yorkshire | Mosaic of semi-natural habitats including woodland, marshy grassland, swamp and standing water with features of structural importance for invertebrates. | 1.62 km from the Scoping Boundary |
| Weedley Dale Candidate LWS | North and East Yorkshire | Mixed woodland, semi-improved grassland | 1.80 km from the Scoping Boundary |
| Lincolnshire LWS's | | | |
| Folly Drain North LWS | Lincolnshire | The main habitats present are drain, coarse grassland and reedbed. This is a major part of a long drain, extending 9.5 km upstream in a south-south-westerly direction from Pilfrey Bridge. The channel varies in width from 8 m wide near Pilfrey Bridge to around 3 m wide at the opposite end of the site. Much adjoining land is of value for its drain flora and fauna, including part of Hatfield Chase Ditches Site of Special Scientific Interest. | Within the Scoping Boundary |
| Hatfield Waste Drain LWS | Lincolnshire | The main habitats present are dense scrub, semi-improved neutral grassland, semi-improved calcareous grassland and running water. This is 10 km of botanically rich canalised drain and its banks, parts of which are very close to, or adjacent to, Hatfield Chase Ditches SSSI. The site supports a very rich aquatic, emergent and marginal flora. A wide range of fauna are present, including many butterflies, damselflies and dragonflies. | Within the Scoping Boundary |
| Langholme Wood LWS | Lincolnshire | The main habitat present is semi-natural woodland. This Lincolnshire Wildlife Trust nature reserve comprises secondary pedunculate oak-silver birch woodland and open heathy areas with a rich flora. The site also supports a variety of bird species. | Within the Scoping Boundary |

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| Melwood Upper Quarry LGS | Lincolnshire | Designated for its geological interest. | Within the Scoping Boundary |
| North Engine Drain, Belton LWS | Lincolnshire | The main habitats present are semi-improved neutral grassland, scattered and dense scrub and running water. This is a 5-10 m wide and 2 km long stretch of canalised watercourse, plus bank habitat, between Hatfield Waste Drain and the A18 to the north, and the River Torne to the south. The site supports a very rich aquatic, emergent and marginal flora, as well as interesting grassland and scrub on both banks. | Within the Scoping Boundary |
| Paupers' Drain LWS | Lincolnshire | The main habitats present are drain and coarse grassland. This is a west-east orientated 7 km stretch of canalised watercourse, with steep banks almost throughout. All parts are rich in wetland plants. | Within the Scoping Boundary |
| River Idle LWS | Lincolnshire | The main habitats present are semi-improved neutral grassland and running water. This is a west-east flowing 2.9 km stretch of the River Idle and some contiguous land on the north bank. Main habitats are occasionally mown neutral grassland, marshy areas, many trees and shrubs, a partly shaded small boundary drain and a substantial woodland pond. The river is approximately 20 m wide here and is not far from its confluence with the Trent at West Stockwith. There is a good wetland flora that is richest in the west, where River Idle Washlands SSSI is adjacent to the south, and the eastern end of Mission Line Bank SSSI adjacent to the north. | Within the Scoping Boundary |
| River Torne LWS | Lincolnshire | The main habitats present are semi-improved neutral grassland, semi-improved calcareous grassland, coarse grassland, running water and standing water. This is over 15 km of botanically rich canalised watercourse and its banks, crossing a major part of the Isle of Axholme from the Doncaster Metropolitan Borough boundary to the Three Rivers complex. A substantial length is adjacent to Hatfield Chase Ditches SSSI, although most neighbouring land is arable or agriculturally improved grassland. The river and other water features support a rich aquatic, emergent and marginal flora. Much of the bank vegetation | Within the Scoping Boundary |

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| | | receives little management and is therefore dominated by coarse grassland and woody vegetation occurs in various places along the riverbanks, commonly in the form of scattered willow trees and scrub. | |
| Sedge Hole Close LWS | Lincolnshire | The main habitats present are wet woodland/carr and neutral grassland (unimproved). This is a small Lincolnshire Wildlife Trust nature reserve located south-east of East Lound on the Isle of Axholme. It comprises three distinct habitats: a small, botanically rich, ridge-and-furrow hay meadow in the north; un-managed wet woodland and shallow water in the south; and un-managed scrub and other coarse vegetation in the south-west. The reserve also supports an abundant population of bird species. | Within the Scoping Boundary |
| South Engine Drain, Belton LWS | Lincolnshire | The main habitats present are semi-improved neutral grassland, running water and reedbed. This is a botanically rich canalised watercourse and its banks, extending eastwards for more than 3 km, from the point where South Engine Drain ceases to be part of Hatfield Chase Ditches SSSI, to the Three Rivers complex. The site supports a rich aquatic, emergent and marginal flora. | Within the Scoping Boundary |
| South Moor Covert and Fishpond Plantation LWS | Lincolnshire | The main habitats present are semi-natural woodland and a pond. Supports woodland and pond habitat. The site also supports a diverse population of bird and invertebrate species. | Within the Scoping Boundary |
| Stainforth and Keadby Canal Corridor LWS | Lincolnshire | The main habitats present are drain, canal, coarse grassland and reedbed. The canal supports a rich aquatic flora that throughout its length includes common, fat and greater duckweed, spiked water-milfoil (<i>Myriophyllum spicatum</i>), fennel and perfoliate pondweed (<i>Potamogeton perfoliatus</i>) and the non-native curly and Nuttall's waterweed (<i>Elodea nuttallii</i>). The variety of dry, damp and wet habitats in this large site has encouraged development of a diverse fauna, including dragonflies, damselflies, butterflies and birds. | Within the Scoping Boundary |
| Three Rivers LWS (Lincolnshire) | Lincolnshire | The main habitats present are scattered and dense scrub, semi-improved neutral grassland and running water. This is a very important corridor of wildlife habitats, extending north- | Within the Scoping Boundary |

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| | | eastwards for 3 km from Pilfrey Bridge to Keadby Pumping Station. It comprises three parallel canalised watercourses, plus surrounding and intervening banks. The watercourses support a rich aquatic, emergent and marginal flora. A wide range of fauna is supported, including grass snake and turtle doves (<i>Streptopelia turtur</i>), as well as many butterflies, damselflies, dragonflies and other birds. | |
| Warping Drain Corridor LWS | Lincolnshire | <p>The main habitats present are: scattered and dense scrub, semi-improved neutral grassland, unimproved acid grassland, marsh/fen, running water, ruderal.</p> <p>This is an exceptionally important continuous strip of wildlife habitats, extending for almost 10 km from Idle Bank Road in the west to the River Trent in the east. Habitat between and beside these watercourses adds considerably to overall diversity, particularly fen/marsh, acidic and neutral grassland, and scattered and dense scrub with trees. Warping Drain has a very rich flora of aquatic and emergent species, and a range of neutral grassland plants are present on areas kept clear of scrub by management. The mixture of rich habitats within the corridor supports locally important populations of birds, butterflies, dragonflies and damselflies, with the likelihood that other faunal groups are also well represented. Many turtle doves and several willow tits (<i>Poecile montanus</i>) were recorded along the mostly wooded strip between the two drains.</p> | Within the Scoping Boundary |
| Warping Drain, Derrythorpe LWS | Lincolnshire | <p>The main habitats present are: scattered and dense scrub, semi-improved neutral grassland, unimproved acid grassland, marsh/fen, running water and ruderal.</p> <p>This is a 1.5 km stretch of steeply banked and canalised drain extending westwards from the west bank of the River Trent at Derrythorpe. The watercourse flora is diverse and interesting, amongst the many water plants present are shining and fennel pondweed, water-starwort, water-cress, fan-leaved water-crowfoot and the locally scarce water-violet.</p> | 270 m south-east |
| Keadby Boundary Drain LWS | Lincolnshire | <p>The main habitats present are: drain and semi-improved neutral grassland.</p> <p>This site comprises two connected parts, the first being nearly 0.5 km</p> | 340 m east |

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| | | of Keadby Boundary Drain between its junction with Warping Drain at the northern end and with an un-named tributary drain at the southern end. Aquatic vegetation is abundant throughout, including water-starwort, Nuttall's waterweed, and common and ivy-leaved duckweed, as well as the locally uncommon whorled water-milfoil, water-violet and needle spike-rush. | |
| Keadby Warping Drain LWS | Lincolnshire | The main habitats present are: drain and coarse or rank grassland. This is a botanically rich 15 m wide drain extending west-north-westwards for more than 2 km from the west bank of the River Trent. | 520 m east |
| Axholme Line, Belton LWS | Lincolnshire | The main habitat present is scrub. 600 m stretch of disused railway line located between the A161 and the Old Belton Brickworks. Most of the site supports woody vegetation on either side of a loosely surfaced central strip. Fragments of un-managed calcareous and neutral grassland are most evident towards the southern end of the site. | 680 m west |
| Former Landfill, Belton LWS | Lincolnshire | The main habitat present is semi-improved neutral grassland. This capped landfill site is dominated by coarse grassland, the western part also supporting some established and recently planted trees and shrubs. In contrast, towards the north-east is a substantial area of shorter, sparser and richer sward, as well as a pond. | 700 m west |
| Belton brickworks LWS | Lincolnshire | The main habitats present are: scrub, damp grassland/marsh/fen and standing water. Diverse wetland site that supports scrub, damp grassland, marsh and fen and several ponds. Other habitats present include wet woodland, semi-improved neutral grassland. The area is prone to frequent/prolonged flooding and seasonally wet and damp areas. | 1 km west |
| Rush Furlong LWS | Lincolnshire | The main habitat present is semi-improved neutral grassland. The great majority of this site is owned and managed by Lincolnshire Wildlife Trust, as is the adjacent Rush Furlong SSSI. All parts are managed as hay meadow, with the aim of improving the neutral grassland flora that developed under past management according to the ancient strip-farming system. The SSSI has long been known for | 1.04 km west |

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| | | its good population of green-winged orchids, and in recent years numbers have been rapidly increasing throughout other parts of the reserve. The reserve also supports an abundant population of bird species. | |
| Crowle Brick Pits LWS | Lincolnshire | <p>The main habitats present are: lake wetland and semi-natural woodland.</p> <p>This site consists of lakes and woodland, with a small meadow area in the north. There are six lakes within the site. They have good marginal and aquatic vegetation, including stands of common reed (<i>Phragmites australis</i>). The lakes support populations of dragonflies and damselflies, and water birds. This is a small open meadow to the north-west of the north-eastern lake, surrounded by scrub and trees. It has an open short to long sward supporting a range of neutral and calcareous grassland species, including bee orchid. The woodlands in the north-west, west and south-west of the site provide biodiversity interest through habitat diversity. They are used by nesting birds, and badgers possibly use the area. Anthills are present within grassy glades.</p> | 1.06 km south-west |
| Belton Picnic Area LWS | Lincolnshire | <p>The main habitat present is unimproved neutral grassland.</p> <p>Fairly diverse area of woodland, scrub and neutral grassland, on land that was formerly crossed by a railway line.</p> | 1.15 km west |
| South Soak Drain, Keadby LWS | Lincolnshire | <p>The main habitats present are: semi-improved neutral grassland and running water.</p> <p>This is a 550 m stretch of drain that flows south-eastwards into the Three Rivers complex; it is adjacent to Keadby Wet Grassland. Approximately 10 m wide, the drain supports a rich aquatic, emergent and marginal flora. The strip of land west of the drain and track is fairly damp and supports un-managed coarse vegetation that includes some scrub and much common reed.</p> | 1.56 km east |
| Keadby Wet Grassland LWS | Lincolnshire | <p>The main habitats present are: neutral grassland, damp grassland/ marsh/fen and grazing marsh.</p> <p>This site is adjacent to South Soak Drain, Keadby. It is an area of neutral grassland, marsh and swamp, with several internal drains that</p> | 1.69 km east |

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| | | <p>are shallow and unfenced. The wetter parts of the site support large populations of robust wetland plants such as common reed, reed canary-grass (<i>Phalaris arundinacea</i>), reed sweet-grass (<i>Glyceria maxima</i>), bulrush (<i>Typha latifolia</i>), yellow iris (<i>Iris pseudacorus</i>), hard rush (<i>Juncus inflexus</i>) and false fox-sedge (<i>Carex otrubae</i>). Associated species include meadowsweet (<i>Filipendula ulmaria</i>), water figwort (<i>Scrophularia umbrosa</i>), amphibious bistort (<i>Persicaria amphibia</i>), common fleabane (<i>Pulicaria dysenterica</i>), angelica (<i>Angelica archangelica</i>), gypsywort (<i>Lycopus europaeus</i>), cuckooflower (<i>Cardamine pratensis</i>) and marsh foxtail (<i>Alopecurus geniculatus</i>). A few specimens of southern marsh-orchid (<i>Dactylorhiza praetermissa</i>) were discovered, and the comparatively small areas of open water support common species such as water-starwort and common duckweed.</p> | |
| Keadby Wetland LWS | Lincolnshire | <p>The main habitats present are scrub and fen. This is an un-managed strip of mostly waterlogged ground between South Soak Drain to the west and Stainforth to Keadby Canal to the north. Keadby wetland comprises a dense mixture of: willow scrub; other scrub and trees; tall wetland vegetation with much common reed, as well as bulrush, great willowherb (<i>Epilobium hirsutum</i>) and reed canary-grass; and ruderal species such as nettles and thistles. Of additional note is the presence of an endemic hybrid, the non-native parents being hairy and large bindweed; this plant has large pink flowers and is very scarce nationally.</p> | 1.69 km east |
| Burton upon Stather Brick Pit LWS | Lincolnshire | <p>The main habitats present are: scrub, standing water and reedbed. Large water-filled former brick pit immediately east of the embankment that follows the eastern shore of the River Trent. Virtually all of the pit margins support dense reed, with some gaps where anglers maintain access. Vegetation outside the pit comprises trees and mature scrub, scattered scrub, planted garden shrubs, ruderal habitat, and neutral grassland that is mostly maintained as lawn, parking areas and paths.</p> | 1.72 km east |
| Axholme Line, Haxey LWS | Lincolnshire | <p>The main habitats present are semi-natural woodland and scrub. Stretch of former railway line that supports a mosaic of semi-natural</p> | 1.78 km north-west |

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| | | woodland, scrub, semi-improved neutral grassland, semi-improved calcareous grassland, semi-improved acid grassland, and streams and springs. | |
| Axholme Railway Cutting LGS | Lincolnshire | Primarily a geological site. | 1.78 km north-west |
| Epworth meadows LWS | Lincolnshire | The main habitat present is neutral grassland. Botanically rich neutral grassland occupies the majority of this 1.9 ha field that is located just west of Epworth. Other features are coarse and woody vegetation on boundaries, a disused building and associated old hard standing, and soil mounds. | 1.96 km west |

Nottinghamshire/Bassetlaw District LWS's

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| Chesterfield Canal (Welham to Misterton) LWS | Nottinghamshire/ Bassetlaw District | This section of the Chesterfield Canal runs from Misterton in the north down to Welham in the south. Its banks support a rich diversity of marginal plant species. The canal runs through a mostly arable landscape providing a corridor for wildlife both in the canal and along the hedgerows and trees which line its banks. | Within the Scoping Boundary |
| Mother Drain, Misterton LWS | Nottinghamshire/ Bassetlaw District | This section of the Mother Drain runs from Haxey Gate Bridge in a south-easterly direction to West Stockwith on the River Trent. The site is of importance for invertebrates, notably moths and water beetles. | Within the Scoping Boundary |
| Headon Verges LWS | Nottinghamshire/ Bassetlaw District | These trackside verges, situated on base-rich clays, are rich in herbs and grasses associated with unimproved grassland. The site is bounded by species-rich hedgerows. Verges like this sheltered by old hedgerows are important for invertebrates and for nesting and feeding birds. | Within the Scoping Boundary |
| Wooden Beck Hill Verges LWS | Nottinghamshire/ Bassetlaw District | These botanically interesting roadside verges support both unimproved species-rich grassland and remnants of ancient woodland. At the top of the hill the wider verge supports a species-rich grassland backed by mature hedgerows. | Within the Scoping Boundary |
| River Idle and Banks, West Stockwith LWS | Nottinghamshire/ Bassetlaw District | This stretch of the River Idle runs from Haxey Gate Bridge to West Stockwith where it joins the River Trent. The often-steep banks | Within the Scoping Boundary |

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| | | support abundant tall ruderal vegetation with large areas dominated by Butterbur (<i>Petasites hybridus</i>), the food plant of the Butterbur Moth (<i>Hydraecia petasitis</i>) which occurs on this site. Elsewhere the banks are wooded. | |
| Maumhill Wood LWS | Nottinghamshire/ Bassetlaw District | The woodland provides valuable habitat for birds and mammals in a predominantly arable landscape. There is also an abundance of dead decaying wood which provides habitat for invertebrates. | Within the Scoping Boundary |
| Tongs and Dogholes Woods LWS | Nottinghamshire/ Bassetlaw District | These two small deciduous broadleaved woodlands are situated in an arable landscape surrounded by fields. They are dissected by a ditch with Tongs Wood to the north and Dogholes Wood to the south. The site is relatively undisturbed with no public access and provides habitat for woodland birds and mammals in a predominantly arable landscape. | Within the Scoping Boundary |
| Saundby Park Wood LWS | Nottinghamshire/ Bassetlaw District | A secondary woodland with locally dominant ash (<i>Fraxinus excelsior</i>) and locally frequent sycamore (<i>Acer pseudoplatanus</i>) and pedunculate oak (<i>Quercus robur</i>). In the understory there is much elder (<i>Sambucus nigra</i>) and the occasional coppiced hazel (<i>Corylus avellana</i>). A large proportion of the ground flora is dominated by bramble (<i>Rubus fruticosus</i>), with locally abundant common nettle (<i>Urtica dioica</i>). Wetter patches are occupied by stands of tufted hair-grass (<i>Deschampsia caespitosa</i>), creeping buttercup (<i>Ranunculus repens</i>) and meadowsweet. | Within the Scoping Boundary |
| Walkeringham Claypits LWS | Nottinghamshire/ Bassetlaw District | This site was originally clay pits which were used for landfill before being capped off with 'river sand', seeded with an agricultural grass mix and in places planted up with Corsican Pine and broadleaved trees. It became a Nottinghamshire Wildlife Trust Nature Reserve in 1990. The site now comprises a mosaic of habitats with areas of short rabbit-grazed grassland interspersed with dense beds of common nettle, rosebay willowherb (<i>Chamerion angustifolium</i>) and patches of bramble. The sward of the grassland is species-rich in places containing species such as fairy flax (<i>Linum catharticum</i>), common bird's-foot-trefoil (<i>Lotus corniculatus</i>) and common centaury | Within the Scoping Boundary |

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| | | (<i>Centaureum erythraea</i>). A pond near the car park is fenced off but appears to be dominated by bulrush and great willowherb. | |
| High House Road Verge, Sturton le Steeple LWS | Nottinghamshire/ Bassetlaw District | The verges of this track/bridleway are backed by shallow ditches and well-maintained hedgerows with pedunculate oak and ash trees. | Within the Scoping Boundary |
| Fledborough to Harby Dismantled Railway LWS | Nottinghamshire/ Newark and Sherwood District | This long length of disused railway line has a rich floristic diversity with areas of open grassland and scrub. The composition of the vegetation ranges from well-developed scrub to low-growing pioneer plants colonising rabbit-disturbed soils and the bare ground of old stations and sidings. The site supports a number of notable plant species including hoary cinquefoil (<i>Potentilla argentea</i>), wild liquorice (<i>Astragalus glycyphyllos</i>), small flowered buttercup (<i>Ranunculus parviflorus</i>) and fine-leaved vetch (<i>Vicia tenuifolia</i>). | Within the Scoping Boundary |
| Retford Gate Green Lane LWS | Nottinghamshire/ Bassetlaw District | This long stretch of green lane is situated in close proximity to Local Wildlife Sites 2/629 Hutchinson's Holt and 2/630 Caddow Wood. It is bordered by ditches and species rich hedgerows with plants indicative of ancient woodland, such as primrose (<i>Primula vulgaris</i>) and greater stitchwort (<i>Stellaria holostea</i>) growing in the hedge bottoms. The hedgerows contain many woody species including hawthorn (<i>Crataegus monogyna</i>), hazel, field maple (<i>Acer campestre</i>), dogwood (<i>Cornus sanguinea</i>) and wych elm (<i>Ulmus glabra</i>). | Within the Scoping Boundary |
| Tindale Drain LWS | Nottinghamshire/ Bassetlaw District | This long length of drain is set in an intensively managed arable landscape which was once fenland. Much of the western part of the site is dry. Sites such as this provide a refuge for fenland plants which would have once been common in the landscape and now survive as relict populations. | Within the Scoping Boundary |
| Cowsland Stripe LWS | Nottinghamshire/ Bassetlaw District | Supports a linear strip of broadleaved woodland. A number of ancient woodland indicator species are found in the ground flora including bluebell (<i>Hyacinthoides non-scripta</i>), woodruff (<i>Galium odoratum</i>), greater stitchwort and yellow archangel (<i>Lamium galeobdolon</i>). | Within the Scoping Boundary |

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| Marnham Railway Yard Candidate LWS (Nottinghamshire) | Nottinghamshire/ Bassetlaw District | <p>This site comprises a strip of land along the southern side of an old disused railway line. It includes parts of what was Fledborough Station with areas of hardstanding having been colonised by plants and lichens. Species here include common cudweed (<i>Filago vulgaris</i>), field madder (<i>Sherardia arvensis</i>), thyme-leaved sandwort (<i>Arenaria serpyllifolia</i>), common bird's-foot-trefoil and mouse-ear-hawkweed (<i>Pilosella officinarum</i>).</p> <p>To the south of this dry, open area the vegetation comprises tall ruderal, coarse grassland and scrub communities. These habitat types increase to the east with large areas under a dense scrub of hawthorn, bramble and dog rose (<i>Rosa canina</i>). Areas of grassland support zigzag clover (<i>Trifolium medium</i>), common knapweed (<i>Centaurea nigra</i>), lady's bedstraw (<i>Galium verum</i>) and meadow vetchling (<i>Lathyrus pratensis</i>) growing in a sward dominated by false oat-grass (<i>Arrhenatherum elatius</i>).</p> | Within the Scoping Boundary |
| Beast Wood Grassland LWS | Nottinghamshire/ Bassetlaw District | This small unmanaged grassland has a valuable herb content. The site provides good habitat for invertebrates and both feeding and breeding opportunities for farmland birds in an area of mainly arable production. | 10 m south-west |
| Caddow Wood (Northern Assart) LWS | Nottinghamshire/ Bassetlaw District | This small broadleaved woodland has a canopy dominated by ash with wych elm whilst the understorey contains Midland hawthorn (<i>Crataegus laevigata</i>), holly (<i>Ilex aquifolium</i>), field maple and hazel. The ground flora is species rich with ancient woodland indicators such as woodruff, greater stitchwort, bluebell and giant fescue (<i>Schedonorus giganteus</i>). The woodland is undisturbed with no public access providing good habitat for woodland birds and mammals. | 20 m west |
| Treswell Wood LWS | Nottinghamshire/ Bassetlaw District | This broadleaved woodland is a designated SSSI and a Nottinghamshire Wildlife Trust Nature Reserve which is traditionally managed as a rotational coppice with standard trees. It is considered to be one of the best examples of ancient semi-natural woodland on poorly drained clay soils in the county. | 90 m north-west |

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| | | Two ponds in the woodland increase botanical variety and are of known importance for breeding amphibians and water beetles. Plants recorded include great pond-sedge (<i>Carex riparia</i>), yellow iris and marsh marigold (<i>Caltha palustris</i>). The woodland has a well-documented breeding bird population having been used as a bird-ringing site since the early 1970's. It also supports a number of native mammals with dormouse (<i>Muscardinus avellanarius</i>) being re-introduced by the Wildlife Trust in the mid 1990's. | |
| Wheatley Wood LWS | Nottinghamshire/ Bassetlaw District | <p>This broadleaved deciduous woodland is situated behind Wheatley Wood Farm. The canopy is dominated by sycamore and ash with an understorey of hawthorn, holly, elder and regenerating English and wych elm. The ground flora contains species indicative of ancient woodland such as yellow archangel, bluebell, wood anemone (<i>Anemone nemorosa</i>) and greater stitchwort. The wood has no public access, although mown paths lead in from the gardens of Wheatley Wood Farm.</p> <p>This site comprises a now wooded disused gypsum pit. The wood is little disturbed, providing good habitat for birds and mammals. Dead wood present benefits invertebrates.</p> | 90 m west |
| Misterton Pasture LWS | Nottinghamshire/ Bassetlaw District | This cattle-grazed pasture has semi-improved neutral grassland, marshy grassland and scattered hawthorn scrub. | 110 m south-west |
| Fledborough Holme LWS | Nottinghamshire/ Bassetlaw District | This site comprises pastureland encircled by a ditch with an oxbow pond and the River Trent to the east. The banks of the river are steep with an emergent flora at the base supporting species such as creeping yellow-cress (<i>Rorippa sylvestris</i>) and celery-leaved buttercup (<i>Ranunculus sceleratus</i>) whilst the upper bank is lined with trees and shrubs and has a tall herb vegetation. The oxbow pond is dominated by reed sweet-grass the edges being fringed by hawthorn and willow (<i>Salix</i> sp.). To the south of the pond the ditch is mostly dry and filled with Common Nettle; while to the north the ditch is variously filled with Reed Sweet-grass or Reed Canary-grass. The grassland is semi-improved, grazed by cattle and probably relict flood meadow with Great Burnet (<i>Sanguisorba officinalis</i>), Cuckoo-flower, Lady's | 200 m north-east |

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| | | Bedstraw and Meadow Foxtail (<i>Alopecurus pratensis</i>) among other species. | |
| Muspitt Lane LWS | Nottinghamshire/ Bassetlaw District | This lane is a bridleway and footpath and forms part of the Trent Valley Way. The narrow verges are species-rich in places with a sward supporting grass species such as Yellow Oat-grass (<i>Trisetum flavescens</i>) and Meadow Foxtail. Notable forbs include Cowslip (<i>Primula veris</i>), Field Scabious (<i>Knautia arvensis</i>), Lady's Bedstraw and Crosswort (<i>Cruciata laevipes</i>). Hedgerows border some of the track and are species-rich in places with species including Field Maple, Buckthorn (<i>Rhamnus catharticus</i>) and Midland Hawthorn. | 230 m north-west |
| Clarborough Tunnel LWS | Nottinghamshire/ Bassetlaw District | This site is situated alongside and over an active railway line and comprises unimproved calcareous grasslands, developing woodlands, an old orchard and railway embankments. A designated SSSI, Clarborough Tunnel is managed by the Nottinghamshire Wildlife Trust. The site supports many ivy-clad trees and dead decaying wood which provides habitats for invertebrates and nest sites for woodland birds. | 320m west |
| Beckingham Wood LWS | Nottinghamshire/ Bassetlaw District | A broadleaved woodland with a canopy dominated by ash with pedunculate oak and wild service-tree (<i>Sorbus torminalis</i>) above an understorey of hawthorn, hazel, field maple, and elder. The species-rich ground flora is indicative of ancient woodland and includes wood anemone, bluebell, bugle (<i>Ajuga reptans</i>), and greater stitchwort. A pond at the south-western edge of the site, with a developing marginal flora, increases wildlife habitats, whilst dead wood left on the woodland floor supports invertebrate fauna. The woodland as a whole provides a good habitat for birds and mammals in a predominantly arable landscape. The wood is dissected by an access road to a nearby farm but is otherwise undisturbed. | 320 m south-west |
| Old Trent, Marnham LWS | Nottinghamshire/ Bassetlaw District | This site comprises the old course of the River Trent with associated wetland habitats and an interesting selection of marginal and aquatic plant species. The channel varies from being steep sided with well vegetated banks, to wider stretches with lower banks supporting a | 360 m south-east |

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| | | variety of willow. The site provides valuable habitat for amphibians and odonata in an intensively farmed landscape. | |
| Shaw Ponds LWS | Nottinghamshire/ Bassetlaw District | This site was once part of a brick works and comprises a series of old extraction pits, long abandoned and now flooded. The water level in the ponds varies seasonally, often drying out in summer. Wet marshy areas at the margins and in-between ponds support a rich marginal and emergent vegetation. The ponds are fringed by mature willow with fallen trees being left in situ to continue growing, creating a dense cover of vegetation. In drier areas hawthorn scrub grows over a ground flora typical of developing secondary woodland with common nettle, bramble, and ivy (<i>Hedera helix</i>). The undisturbed nature of the site and density of the vegetation provide habitat for birds and mammals whilst the ponds present breeding opportunities for amphibians. Dead and decaying wood, of which there is plenty, provide habitat for invertebrates. | 370 m west |
| Chesterfield Canal (Misterton to West Stockwith) LWS | Nottinghamshire/ Bassetlaw District | A stretch of the Chesterfield Canal with a well-developed marginal flora, unmanaged grassland, scrub and mature willow trees. | 450 m south-east |
| Bushstocks Lane Meadow LWS | Nottinghamshire/ Bassetlaw District | This old hay meadow has a sward containing many plant species indicative of unimproved neutral grassland. This species-rich grassland attracts many butterflies, bees and other insects. The mature hedgerows, which bound the site on three sides, provide habitat for birds and small mammals. | 520 m south-east |
| Blue Stocking Lane, Clarborough LWS | Nottinghamshire/ Bassetlaw District | Blue Stocking Lane is a bridleway with verges and rich hedgerows running in roughly a north-south direction to the east of Clarborough. The verges are species-rich in places, especially on wider sections. The central section, where the path runs alongside a deep ditch, of the site is wooded, and the ground flora here includes plants indicative of ancient woodland. | 580 m west |
| North Wheatley Beck LWS | Nottinghamshire/ Bassetlaw District | A stream of interest for water beetles. | 580 m west |

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| Hutchinson's Holt LWS | Nottinghamshire/ Bassetlaw District | Deciduous woodland which supports breeding birds including summer migrants such as chiffchaff (<i>Phylloscopus collybita</i>) and willow warbler (<i>Phylloscopus trochilus</i>) and dead wood left lying on the ground provides habitat for invertebrates. The species-rich ground flora of the woodland contains many plants associated with ancient woodland including abundant greater stitchwort and dog's mercury (<i>Mercurialis perennis</i>), with bluebell, yellow archangel, and wood anemone. | 640 m west |
| North Clifton Church LWS | Nottinghamshire/ Newark and Sherwood District | This site comprises the churchyard of North Clifton Church which is situated close to the River Trent in between the villages of North Clifton and South Clifton. The underlying blown-sand soils produce a notable sward with species recorded including lady's bedstraw, sheep's sorrel (<i>Rumex acetosella</i>), and lesser stitchwort (<i>Stellaria graminea</i>). The churchyard is bordered by mature evergreen and deciduous trees and surrounded by pasture. | 650 m east |
| Skegby Road Triangle LWS | Nottinghamshire/ Bassetlaw District | This site comprises a roadside verge of unimproved neutral grassland. The sward contains abundant false oat-grass with other grass species including Yorkshire-fog (<i>Holcus lanatus</i>), meadow barley (<i>Hordeum secalinum</i>), and common bent (<i>Agrostis capillaris</i>). Forbs include common knapweed, greater burnet (<i>Sanguisorba officinalis</i>), pepper-saxifrage (<i>Silaum silaus</i>), and lady's bedstraw, indicating the diversity of the verge. | 710 m south-west |
| Kingshaugh Farm Earthwork LWS | Nottinghamshire/ Bassetlaw District | This historically important site is a Scheduled Ancient Monument containing ring earthworks and the site of Darlton Castle. Much of it comprises semi-improved grassland with few forbs, on an undulating topography grazed by sheep. Interest is added by the remains of an old orchard with scattered old apple (<i>Malus pumila</i>) trees, some hawthorn, and yew (<i>Taxus baccata</i>), and a mature hazel underneath which the county-rare green hellebore (<i>Helleborus viridis</i>) grows. A stream which flows around the boundary of the earthwork has mature crack willow (<i>Salix fragilis</i>) growing along its banks, while the northeast corner of the site supports a tall ruderal community of creeping thistle (<i>Cirsium arvense</i>), hogweed (<i>Heracleum sphondylium</i>), and common nettle. | 720 m south-west |

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| Ashton's Meadow LWS | Nottinghamshire/ Bassetlaw District | This meadow is a Site of Special Scientific Interest (SSSI) owned and managed by the Nottinghamshire Wildlife Trust. The sward is unimproved and species-rich with a range of characteristic grasses and forbs. The site is bordered by hedgerows with trees and is set in an arable landscape providing an important source of nectar-rich habitat for insects. | 800 m east |
| Mother Drain East, Gringley LWS | Nottinghamshire/ Bassetlaw District | The drain supports notable aquatic flora, it also provides breeding opportunities for amphibians and odonata and is known to support grass snake. | 820 m west |
| South Clifton Grassland LWS | Nottinghamshire/ Newark and Sherwood District | This neutral pasture is situated next to the River Trent on the floodplain. The sward contains bulbous buttercup (<i>Ranunculus bulbosus</i>), field wood-rush (<i>Luzula campestris</i>), common bird's-foot-trefoil, pignut (<i>Conopodium majus</i>), and grasses such as Yorkshire-fog, sweet vernal grass (<i>Anthoxanthum odoratum</i>), meadow foxtail, and smooth meadow-grass (<i>Poa pratensis</i>). | 890 m south-east |
| Clayworth Woodhouse Pond LWS | Nottinghamshire/ Bassetlaw District | This old farm pond with a small central vegetated island has an interesting marginal and emergent flora. Its edges support large stands of yellow iris with locally abundant water mint (<i>Mentha aquatica</i>), tufted forget-me-not (<i>Myosotis laxa</i>), golden dock (<i>Rumex maritimus</i>), and common spike-rush (<i>Eleocharis palustris</i>) growing in a marshy area at the southern end. The site supports breeding common frog (<i>Rana temporaria</i>) and provides habitat for odonata. | 1.03 km south-west |
| Grove Road Woodland LWS | Nottinghamshire/ Bassetlaw District | Supports a small deciduous woodland. The ground flora contains a number of plant species which are indicative of ancient woodland. These include dog's mercury, wood millet (<i>Milium effusum</i>), greater stitchwort, woodruff, pignut, and Goldilocks buttercup (<i>Ranunculus auricomus</i>). Set in an arable landscape, this small, relatively undisturbed remnant of ancient woodland provides a refuge for birds and mammals. | 1.05 km west |
| Retford Road Wood, Rampton LWS | Nottinghamshire/ Bassetlaw District | Supports an area of broadleaved woodland located in a largely arable landscape. | 1.06 km east |

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| Misterton Soss Ponds LWS | Nottinghamshire/ Bassetlaw District | A fishing lake created on the site of old borrow pits. The lake has extensive beds of common reed at the margins and a small island dominated by the county-rare great fen-sedge (<i>Cladium mariscus</i>). The site is set in an arable landscape and is bordered by hawthorn and blackthorn (<i>Prunus spinosa</i>) hedgerows. | 1.07 km south-east |
| West Burton Meadow LWS | Nottinghamshire/ Bassetlaw District | An unimproved ridge and furrow grassland owned and managed by the Nottinghamshire Wildlife Trust. The flora of the neutral clay soils includes a variety of grasses such as yellow oat-grass, quaking-grass (<i>Briza media</i>), sweet vernal-grass, and meadow foxtail. Abundant amongst the forbs are cowslip, common bird's-foot-trefoil, common knapweed, and yellow-rattle, with other species including lady's bedstraw, green-winged orchid, and rough hawkbit (<i>Leontodon hispidus</i>). | 1.09 km east |
| Lancaster Lane Hedge, Gringley LWS | Nottinghamshire/ Bassetlaw District | This short stretch of species rich hedgerow is situated in an intensively farmed arable landscape. Evidence of having been laid in the past can be seen in the hedge bottom which also contains dog's mercury, a species indicative of ancient woodland. | 1.11 km south-west |
| Lover's Lane, Clayworth LWS | Nottinghamshire/ Bassetlaw District | This site is situated in an intensively farmed arable landscape. It comprises a linear deciduous woodland and small area of relict unimproved neutral grassland bordered by hedgerows. | 1.13 km south-west |
| Marsh Road Pond Walkeringham Candidate LWS | Nottinghamshire/ Bassetlaw District | This large pond, situated in an arable field, is surrounded by scrub and tall ruderal vegetation with an earth bank along its western and southern sides vegetated by bramble, common nettle, hemlock (<i>Conium maculatum</i>), and patches of creeping thistle. The margins of the pond are dominated by yellow iris with bulrush and grey club-rush (<i>Schoenoplectus tabernaemontani</i>) growing alongside water mint and creeping-jenny (<i>Lysimachia nummularia</i>). The pond is dominated in part by a large patch of white water-lily (<i>Nymphaea alba</i>) while spiked water-milfoil prevails in the submerged flora. This site provides a source of water for wildlife and breeding opportunities for birds, mammals, amphibians, and odonata. | 1.13 km north-east |

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| Old Trent Oxbow Spalford LWS | Nottinghamshire/ Newark and Sherwood District | This site comprises the remnants of an ox-bow lake, associated drains and a pond. | 1.16 km south-east |
| Soss Lane Grassland, Misterton LWS | Nottinghamshire/ Bassetlaw District | This horse-grazed pasture is bordered by mature outgrown hedgerows and comprises semi and unimproved neutral grassland. A steep bank along the inside of the southern and eastern boundary is particularly species-rich. | 1.23 km south-east |
| Dunham Oxbow LWS | Nottinghamshire/ Bassetlaw District | This site comprises an oxbow lake near the River Trent with associated marsh and wet woodland which support an interesting variety of characteristic plant species. | 1.29 km east |
| Grovefield Stripe LWS | Nottinghamshire/ Bassetlaw District | This strip of broadleaved woodland has a canopy dominated by old ash stools, a relic of coppicing many years ago. Field maple, wych elm, holly, and hawthorn grow in the understorey over a ground flora containing many plants which are indicative of ancient woodland. These include bluebell, early-purple orchid (<i>Orchis mascula</i>), greater stitchwort, pignut, and moschatel (<i>Adoxa moschatellina</i>) with grasses hairy-brome (<i>Bromopsis ramosa</i>) and giant fescue. | 1.29 km north-west |
| Walkeringham Pasture LWS | Nottinghamshire/ Bassetlaw District | This noteworthy damp grassland is situated between Walkeringham and Misterton. It has a sward comprising grasses such as red fescue (<i>Festuca rubra</i>), meadow foxtail, Yorkshire-fog, common bent and in wet areas floating sweet-grass (<i>Glyceria fluitans</i>) and tufted hair-grass. Glaucous sedge (<i>Carex flacca</i>), hard rush and field wood-rush add further botanical interest while among the forbs cowslip, cuckooflower, common knapweed and bulbous buttercup can be found. | 1.37 km north-east |
| Dunham Dubs LWS | Nottinghamshire/ Bassetlaw District | This site, situated next to the Trent, comprises two lakes, the riverbank and a small area of marsh on the opposite bank. The lakes, which are used for angling, are surrounded by sheep-grazed improved grassland, with groups of planted broad-leaved trees. A flood bank runs along the western boundary and another divides the two lakes. The smaller, more easterly lake has a well-developed | 1.42 km east |

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| | | marginal flora and a marshy area at its northern end. The river bank is dominated by tall ruderal vegetation. | |
| Askham Grassland LWS | Nottinghamshire/ Bassetlaw District | This semi-improved, cattle-grazed grassland has some ridge and furrow evident. An acidic influence on the soil is indicated by the dominance of common bent, locally frequent devil's-bit scabious (<i>Succisa pratensis</i>) and occasional tormentil (<i>Potentilla erecta</i>). Other species present including great burnet, lady's bedstraw and field wood-rush provide additional diversity. | 1.58 km west |
| Whinleys Road Woodland LWS | Nottinghamshire/ Bassetlaw District | This small secondary woodland is situated in between Whinleys Road to the south and a public footpath to the north. A deeply incised stream runs through the western part of the site. The canopy is dominated by ash with some wych elm, whilst the understorey has abundant hawthorn with field maple, wild privet (<i>Ligustrum vulgare</i>), hazel and blackthorn among others. The ground flora supports a number of species which are indicative of ancient woodland with dog's mercury growing abundantly and bluebell, yellow archangel and common figwort (<i>Scrophularia nodosa</i>). | 1.59 km west |
| River Trent, West Stockwith LWS | Nottinghamshire/ Bassetlaw District | This representative stretch of the River Trent is tidal and includes both bankside and associated rough vegetation. A mosaic of common reed, with reed canary-grass and coppiced willow trees of various species is found in many places. Adjoining this are tall herb communities further up the bank and areas of managed and unmanaged grassland. | 1.60 km south-east |
| Beckingham Marshes LWS | Nottinghamshire/ Bassetlaw District | This site comprises a series of cattle-grazed fields divided by drains which are owned and managed by the RSPB. Although the grasslands are generally improved, the drains with their varying water depths hold a great deal of botanical interest with species including fine-leaved water-dropwort, water dock (<i>Rumex hydrolapathum</i>), water star-wort (<i>Callitriche stagnalis</i>) and common reed. In addition, a number of scrapes have been created in the fields to encourage wading birds such as curlew and lapwing. All are fringed by soft rush (<i>Juncus effusus</i>) with areas of mud at the margins supporting marsh foxtail, common bent, floating sweet-grass, celery-leaved buttercup, | 1.62 km east |

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| | | marsh cudweed (<i>Gnaphalium uliginosum</i>) and the county-rare water purslane (<i>Lythrum portula</i>). | |
| Castle Hill Wood, Horse Close Plantation and Swindell Spring Wood LWS | Nottinghamshire/ Bassetlaw District | This site comprises three woodlands, all of which are designated SSSIs. They are characterised by a mixed, but mainly broadleaved canopy dominated by ash and sycamore with a diverse number of tree and shrub species in the understorey. These include wych elm, Midland hawthorn, hazel, field maple, holly, and spindle (<i>Euonymus europaeus</i>). The ground flora is species-rich, containing many plants associated with ancient woodland. Wood anemone, bluebell, yellow archangel, woodruff, pignut, and dog's mercury grow abundantly on the woodland floor. Plenty of dead wood left lying in situ provides habitat for invertebrates. | 1.65 km west |
| Upton Notified Roadside Verge LWS | Nottinghamshire/ Bassetlaw District | The verge is backed by a shallow ditch and well-trimmed hedge dominated by hawthorn with ash, blackthorn, pedunculate oak, and hazel. The sward is mostly dominated by false oat-grass, cock's-foot (<i>Dactylis glomerata</i>), and hogweed with the western end of the site being botanically richer. Species indicative of unimproved grassland include locally abundant meadow vetchling, common knapweed, and common restharrow (<i>Ononis repens</i>) with meadow fescue (<i>Schedonorus pratensis</i>), yellow oat-grass, cowslip, and common bird's-foot-trefoil. | 1.65 km west |
| Scott's Wood LWS | Nottinghamshire/ Bassetlaw District | This small broadleaved woodland is situated on a north facing slope above the Chesterfield Canal and is surrounded by arable farmland. The woodland provides undisturbed habitat for breeding birds and mammals and many fallen trees, left in situ to decay naturally, create a habitat for invertebrates. The site supports numerous species of fungi and a hornet's (<i>Vespa crabro</i>) nest was seen in the base of a tree during the site survey. | 1.70 km west |
| Headon Wood/School House Plantation LWS | Nottinghamshire/ Bassetlaw District | The site comprises two broadleaved woodlands. The ground flora is species-rich with many species indicative of ancient woodland, including wood anemone, bugle, primrose, and early-purple orchid. Bluebell and dog's mercury grow in abundance in places, carpeting | 1.76 km west |

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| | | the woodland floor. There is plenty of dead and decaying wood, both standing and lying, to provide habitat for invertebrates. | |
| Carr Road Drains Complex LWS | Nottinghamshire/ Bassetlaw District | This site comprises a series of deep, straight, steep sided drains in Gringley Carr including Carr Road West Drain and numerous shorter drains situated to the east. The surrounding landscape is flat, drained fenland now growing organic vegetables and arable crops. The channels of the drains support a good selection of aquatic plants. The drains represent a refuge for the plant species associated with the old fenland landscape and provide breeding sites for amphibians and odonata. The shrubs along the drains provide foraging habitat for birds such as willow warbler and whitethroat (<i>Sylvia communis</i>). | 1.77 km west |
| Mill Lane, Clayworth LWS | Nottinghamshire/ Bassetlaw District | A track bordered by mature, partially outgrown species rich hedgerows with verges of unimproved grassland. The site provides good habitat for birds and mammals with potential nesting sites and many berry-bearing shrub species, which form an important corridor for wildlife in an arable landscape. | 1.82 km west |
| Durham Hill Pasture LWS | Nottinghamshire /Bassetlaw District | Supports a mosaic of habitats including grazed pasture, species rich hedgerows, and broadleaved woodland. | 1.84 km west |
| Clarborough Gypsum Pits LWS | Nottinghamshire/ Bassetlaw District | This site, set in an arable landscape, comprises a disused gypsum quarry situated on two-three levels. The developing woodland of is interspersed with open grassland and stands of common nettle and rosebay willow-herb. The higher level also supports herb-rich calcareous grasslands. | 1.89 km west |
| Bole Ings LWS | Nottinghamshire/ Bassetlaw District | An old Trent oxbow with a mosaic of semi-natural habitats including willow scrub, woodland, marshy grassland and associated drains. The site is important for its avifauna with willow tit, barn owl (<i>Tyto alba</i>) and a number of warbler species being recorded in the past. It is also known to be of importance for mammals such as water shrew (<i>Neomys fodiens</i>) and invertebrates such as water beetles. | 1.91 km east |
| Mill Road Verge LWS | Nottinghamshire/ Bassetlaw District | This site comprises species-rich grassland verges along the A631 and an adjacent track, which is elevated above the road at the top of a sloping bank. The verge supports a rich grassland community | 1.92 km south-west |

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| | | <p>containing species such as meadow foxtail, yellow oat-grass, common knapweed, and meadow vetchling, with a damper area supporting spiked sedge (<i>Carex spicata</i>). The top of the dividing bank has a line of shrubs and trees, some of which are planted. Underneath them, plants associated with ancient woodland, such as dog's mercury, hairy brome, and spurge-laurel (<i>Daphne laureola</i>), can be found. The verges of the track contain unimproved grassland with field scabious, ox-eye daisy (<i>Leucanthemum vulgare</i>), upright brome (<i>Bromopsis erecta</i>), glaucous sedge, and bird's-foot-trefoil.</p> | |
| Meadow Lane Grasslands, Normanton on Trent LWS | Nottinghamshire/ Bassetlaw District | <p>This site comprises a collection of unimproved meadows close to the River Trent. There are three meadows divided by thick well-grown hedgerows, all cut for hay, with a fourth having been planted up with ash. To the east lie three much smaller meadows on either side of the track 'Meadow Lane'.</p> | 1.93 km south-east |
| Marsh Drain, Walkeringham LWS | Nottinghamshire/ Bassetlaw District | <p>Supports a silty ditch with (<i>Glyceria fluitans</i>) (Flote-grass), <i>Callitriche</i> species (a water-starwort) and (<i>Helosciadium nodiflorum</i>) (fool's watercress).</p> <p>The drain supports an assemblage of 32 water beetle species and 3 water bug species including Local A water beetle (<i>Ilybius chalconatus</i>) together with Local B species including (<i>Agabus didymus</i>), (<i>Graptodytes pictus</i>), (<i>Helophorus griseus</i>) and (<i>Laccobius sinuatus</i>).</p> | 1.95 km north-east |
| Idle Stop Washland LWS | Nottinghamshire/ Bassetlaw District | <p>This washland is situated on the south side of the River Idle which forms its western boundary while a flood bank planted with mature crack willow borders to the east. Situated in a farmed landscape this remote site offers an undisturbed refuge for wildlife. It is of importance for wintering wildfowl and provides ideal nesting opportunities for birds such as warblers. During the survey marsh harrier was seen hunting and the now very rare turtle dove was heard.</p> | 1.97 km west |
| Plaster Hill Plantation LWS | Nottinghamshire/ Bassetlaw District | <p>This site comprises a now wooded disused gypsum pit with very steep slopes. It is fenced off to the cattle that graze the adjacent pastures. The broadleaved canopy is dominated by ash with</p> | 1.97 km west |

sycamore, and it has an understorey that includes wych elm, both hawthorn and midland hawthorn, elder, and field maple. Dog's mercury dominates the ground flora, with common figwort, wood sedge (*Carex sylvatica*), and primrose also being recorded. The wood is little disturbed, providing good habitat for birds and mammals. Dead wood left lying on the ground benefits invertebrates.

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| West Burton Power Station LWS | Nottinghamshire/ Bassetlaw District | An area of mature habitats within the power station of interest for moths, water beetles/bugs, amphibians and reptiles. | 1.98 km east |
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8.C Arboriculture Strategy

Contents

| | |
|--|-----------|
| 8.C.1 Introduction | 1 |
| 8.C.1.1 Introduction | 1 |
| 8.C.1.2 Regulatory and Planning Context | 1 |
| 8.C.1.3 Approach to Survey and Data Collection | 3 |
| 8.C.1.4 Scope of the Assessment | 7 |
| | |
| 8.C.2 References | 11 |

8.C.1 Introduction

8.C.1.1 Overview

8.C.1.1.1 This document outlines the scope and methodology for the arboriculture assessment for the North Humber to High Marnham Project (hereafter referred to as the 'Project') Development Consent Order (DCO). The assessment will consider the impacts on trees that may arise from the construction of the Project. This document describes the methodology to be used within the arboricultural impact assessment (AIA).

8.C.1.1.2 Arboriculture potentially interfaces with many other aspects and as such, where appropriate, should be considered alongside the following chapters from Volume 1 of the Scoping Report:

- **Chapter 6, Landscape;**
- **Chapter 7, Visual;**
- **Chapter 8, Ecology and Biodiversity;** and
- **Chapter 9, Cultural Heritage.**

8.C.1.2 Regulatory and Planning Context

Legislation

8.C.1.2.1 The legislation and planning policies relevant to arboriculture are described below:

- Town and Country Planning Act 1990;
- Town and Country Planning (Tree Preservation) Regulations 2012;
- Forestry Act 1967;
- The Hedgerows Regulations 1997; and
- The Natural Environment and Rural Communities (NERC) Act 2006.

Planning Policy

National planning policy

National policy statements

8.C.1.2.2 National Policy Statements (NPSs) set out the primary policy tests against which the application for a DCO for the Project would be considered. Paragraph 5.3.14 of the Overarching National Policy Statement for Energy (EN-1) (Ref 8.C.1) states that

“ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The IPC should not grant development consent for any development that would result in its loss or

deterioration unless the benefits (including need) of the development, in that location outweigh the loss of the woodland habitat. Aged or ‘veteran’ trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons why. Applicants should provide a suitable compensation strategy in instances where proposals would result in the loss or deterioration of ancient woodland and ancient or veteran trees”.

8.C.1.2.3 Section 2.8.5 of the National Policy Statement for Electricity Networks Infrastructure (EN-5) sets out guidelines for the routeing of new overhead lines based on the Holford Rules (developed by Lord Holford in 1959) (Ref 8.C.2). The guidelines have been subsequently reviewed and updated and should be followed by developers when designing new overhead line. The Holford Rules requirements in relation to trees include routing overhead lines to maximise the screening benefit of trees. Section 2.8.11 identifies mitigation for new overhead lines which can include off site tree and hedgerow planting to provide screening and to soften visual impacts, this requires agreement with relevant landowners.

8.C.1.2.4 The draft EN-5 update (Ref 8.C.3) currently undergoing consultation contains the Horlock Rules (established by the National Grid in 2009) (Ref 8.C.4) which state that applicants should

“protect as far as reasonably practicable areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows...”.

8.C.1.2.5 Ancient woodland and ancient/veteran trees will be identified within the desk top assessment and the arboricultural walkover survey data. The applicant will set out proposals for their conservation or provide reasons for any unavoidable loss.

National Planning Policy Framework

8.C.1.2.6 Point 180c of the National Planning Policy Framework (Ref 8.C.5) states

“development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons, and a suitable compensation strategy exists”.

Local planning policy

8.C.1.2.7 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District. A summary of the relevant local planning policy which is relevant to the arboricultural assessment and will inform the AIA is provided in **Table 8.C.1.1**. There are no applicable changes to how policy would be considered in the emerging Draft North Lincolnshire Plan or emerging Bassetlaw Local Plan (2020-2037).

Table 8.C.1.1 Local planning policy

| Local Plan | Policy ref | Policy context | How it will be considered |
|---|------------------|--|--|
| East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 8.C.6) | ENV2 | Ensure important hedgerows and trees are retained unless their removal can be justified in the wider public interest. Where important hedgerows and trees are lost replacements will usually be required. | AIA will report on the loss of trees and important hedgerows. |
| North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 8.C.7) | Core Strategy 11 | Requiring the protection of trees, hedgerows and historic landscape to be specified where appropriate. | The AIA report will reference protection measures for retained arboricultural features. |
| Bassetlaw District Local Development Framework – Core Strategy & Development Management Policies DPD (2011) (Ref 8.C.8) | DM9 | Green infrastructure, biodiversity and geodiversity, landscape, open space and sports facilities. Development proposals will not adversely affect or result in the loss of features of recognised importance. | The arboricultural discipline will seek to protect trees, hedgerows and ancient woodlands. |

8.C.1.3 Approach to Survey and Data Collection

Study Area

- 8.C.1.3.1 This document is based upon the information available at the time of writing the Project Scoping Report; however, the AIA study area that will be used to inform the ES will comprise the proposed Order Limits (yet to be confirmed) plus up to a further 30 m buffer either side. The purpose of this 30 m beyond Order Limits is to ensure all arboricultural features whose Root Protection Areas (RPAs) and crowns may be impacted are identified and surveyed. BS 5837 has a maximum RPA radius of 15 m however 30 m is used to ensure additional protection is allowable for any potential veteran and ancient trees and ancient woodland.

Baseline Conditions

Data sources

- 8.C.1.3.2 The AIA will be informed by a desk study and walkover survey.
- 8.C.1.3.3 A desk study will use publicly accessible data including the Woodland Trust's Ancient Tree Inventory, Multi-Agency Geographic Information for the Countryside (MAGIC) maps (Ref 8.C.9) and local authority records. The desk study will record trees known to be within the following classifications:

- ancient, veteran and notable trees;
- ancient woodland;
- traditional orchards;
- tree preservation order (TPO); and
- conservation area.

8.C.1.3.4 A walkover arboricultural survey will be undertaken to capture data for trees falling into the categories below:

- woodlands;
- unverified veteran trees;
- TPO trees;
- Important hedgerows; and
- noteworthy trees and groups. Noteworthy trees are defined as Category A and B trees as set out in Table 1 of BS 5837:2012 Trees in relation to design, demolition, and construction – Recommendations (Ref 8.C.10).

8.C.1.3.5 Where a topographical survey is not available the tree canopy information will be based on aerial imagery and handheld GPS devices (i.e. mobile phone) to record the location of individual trees, groups of trees and woodlands. The surveyor will collectively record trees as a group where they form a cohesive arboricultural feature either aerodynamically, visually, or culturally. Trees of merit such as veteran trees within groups will (where possible) be surveyed as individuals.

8.C.1.3.6 Linear collections of trees which form hedges will be recorded as a linear group. This survey is not a hedgerow assessment; however, the findings of these surveys may be used to inform the biodiversity assessment (**Volume 1, Chapter 8, Ecology and Biodiversity**).

8.C.1.3.7 The walkover survey will focus on high and moderate quality arboricultural features (A and B grade as per BS5837:2012) (Ref 8.C.10). Spatial positioning for remaining trees will be provided using readily available LiDAR data.

8.C.1.3.8 For each arboricultural feature captured in the walkover survey data will be collected including:

- sequential reference number;
- species (listed as common name);
- height (to nearest metre);
- stem diameter (measured at 1.5 m in height), for groups and woodlands the largest diameter will be recorded;
- crown spread (largest spread to the nearest metre);
- life stage (young, semi-mature, early-mature, mature, veteran);
- general observations;
- estimated remaining contribution;
- RPA; and

- category, typically either A or B and subcategory.

8.C.1.3.9 A canopy cover map will be created using remote sensing LiDAR data. This will represent a baseline of all tree canopies and be a guide to inform where arboricultural walkover surveys are required. LiDAR will also provide the spatial basis of those trees not deemed moderate or above quality, so that they may be assessed within the AIA.

Limitations of walkover baseline assessment

8.C.1.3.10 Where access is restricted, tree measurements may be estimated.

8.C.1.3.11 In the absence of information about stem diameter an RPA will be applied to low quality arboricultural features which is at least 2 m beyond canopy spread. Arboricultural data collected does not constitute a health and safety survey. The AIA will be developed using National Grid's vegetation management zones with a focus on the removed and affected managed zones.

Arboricultural constraints reporting

Reporting

8.C.1.3.12 Following the completion of the walkover arboricultural survey, the data will be used to produce a baseline arboricultural survey schedule and a tree constraints plan developed within GIS.

8.C.1.3.13 The GIS based model would comprise of all surveyed arboricultural features from the walkover survey and shown as follows:

- individual trees – tree stem location based on either topographic survey, LiDAR, aerial imagery or GPS, canopy extents illustrated as a circle using the largest recorded crown spread measurement and an RPA as a circular area; and
- tree groups, woodlands and hedgerows – a polygon shape representing the extent of the tree stems plotted whilst in the field. The RPA buffer applied to the polygon based on the largest tree stem diameter recorded for that feature.

Root protection areas

8.C.1.3.14 Other than ancient and veteran trees, the RPA will be calculated on 12 x stem diameter measurement and capped at the maximum RPA measurement of 15 m radius in line with BS 5837 2012 (Ref 8.C.10).

8.C.1.3.15 To provide appropriate protection measures for ancient and veteran trees, the AIA will where reasonably practicable adopt the standing advice (from Natural England and the Forestry Commission) for calculating buffer zones

“for ancient or veteran trees (including those on the woodland boundary), the buffer zone should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5 metres from the edge of the tree’s canopy if that area is larger than 15 times the tree’s diameter. This will create a minimum root protection area”.

Ancient and veteran trees

- 8.C.1.3.16 Trees either verified (via the Woodland Trust's Ancient Tree Inventory) or unrecorded (based on surveyor initial assessment) will be reported with a buffer zone equal to 15 x stem diameter or 5 m beyond the canopy spread, whichever is the greater. All surveyor assessed ancient/veteran trees should undergo further bespoke assessment using an industry accepted assessment methodology (such as 'Raven') or verified via the Woodland Trust's Ancient Tree Inventory program.

High and moderate quality trees

- 8.C.1.3.17 High and moderate quality trees (A and B grade) will be reported with RPAs equal to 12 x stem diameter and canopy extents illustrated as a circle using the largest recorded spread measurement.

Low quality trees

- 8.C.1.3.18 Low quality arboricultural features will be plotted based on remote sensing data and an offset root protection buffer of 3 m applied to the canopy edge of the feature.

Hedgerows

- 8.C.1.3.19 All hedgerows will be reported and surveyed as low-quality features unless other technical disciplines (such as biodiversity/cultural heritage) identify the hedges as being 'important hedgerows'. For these important hedgerows the dominant woody species will be recorded and RPAs calculated (using the largest stem size) from the centre line of the arboricultural feature.

Embedded Environmental Measures

- 8.C.1.3.20 As part of the Project design process, a number of embedded environmental measures will be proposed to reduce the potential for impacts on arboricultural features. These will evolve over the development process as the EIA progresses and in response to consultation, they will be fed iteratively into the assessment process. These measures typically include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation requirements. For example, where reasonably practical, the Project should avoid impacts on ancient woodland and veteran trees.

Control and Management Measures

- 8.C.1.3.21 An Outline CoCP is provided in **Volume 2, Appendix 4.A Outline Code of Construction Practice**. This includes measures relevant to the control and management of impacts related to arboriculture including for example:
- LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to design, demolition and construction. This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. All works to high grade trees, including trees covered by a TPO and veteran trees, will be undertaken or supervised by a suitably qualified arboriculturist.

- 8.C.1.3.22 Additional measures relating to arboriculture may include the following:
- applying the ‘standing advice’ for veteran/ancient tree buffer zones. This is calculated as 15 times stem diameter or 5 m beyond canopy extent (whichever is the greater); and
 - applying the ‘standing advice’ for ancient woodland buffer zones. This is currently a minimum distance of 15 m.

8.C.1.4 Scope of the Assessment

Technical Guidance

- 8.C.1.4.1 The AIA will be carried out in accordance with the following good practice and guidance documents:
- British Standard 5837:2012 – Trees in relation to design, demolition and construction - Recommendations; and
 - Natural England and Forestry Commission ‘standing advice’ for ancient woodland, ancient trees and veteran trees.

Proposed Assessment Methodology

Table 8.C.1.2 Sensitivity

| Sensitivity | Example of potential characteristic |
|-------------|--|
| High | <ul style="list-style-type: none"> • Arboricultural features that are registered on the Ancient Tree Inventory and the extent has been verified on site. • Arboricultural features that have been identified during the walkover surveys as veteran. • Arboricultural features that are within the Ancient Woodland Inventory, and the extent has been verified on site. |
| Medium | <ul style="list-style-type: none"> • Arboricultural features that have been classified as Category ‘A’ in accordance with BS 5837: <ul style="list-style-type: none"> ○ Trees that are particularly good examples of their species, especially if rare or unusual, and are considered to have high arboricultural value. ○ Trees/woodlands of particular visual importance within the landscape. ○ Trees that are essential components of groups, or of formal or semi-formal arboricultural features. • Trees/woodlands of particular conservation, historical, commemorative or other value. • Forests or woodlands that are a particularly good example of their type and are likely to include diverse, structured, semi-natural, and undisturbed ecosystems. |

| Sensitivity | Example of potential characteristic |
|-------------|---|
| | <ul style="list-style-type: none"> ● Forests or woodlands that exhibit high public usage. ● Forests or woodlands with high commercial value or potential. ● Any woodland identified for protection within the local planning authority's forestry and woodland strategy. |
| Low | <ul style="list-style-type: none"> ● Arboricultural features that have been classified as Category 'B' in accordance with BS 5837: <ul style="list-style-type: none"> ○ Trees due to impaired physiological or structural condition are downgraded from Category 'A'. ○ Trees lacking special quality. ○ Trees with limited conservation or other cultural value. ○ Trees present in numbers, usually as groups or woodlands, such that they attract a higher collective rating than they might as individuals or trees occurring as collectives but situated so as to make little visual contribution to the wider locality. ● Forests or woodlands with some high-quality characteristics but which might be disturbed or damaged e.g. from browsing pressure, windthrow or poor management. ● Forest or woodlands lacking special characteristics to be considered high value. ● Forests or woodlands with limited public usage. ● Forests or woodland with limited commercial value or potential. |
| Negligible | <ul style="list-style-type: none"> ● Arboricultural features that have been classified as Category 'C' or Category 'U' in accordance with BS 5837: <ul style="list-style-type: none"> ○ Trees that are of low arboricultural value including unremarkable trees of very limited merit. ○ low or transient landscape benefits. ○ no material conservation or other cultural value. ○ Young trees less than 150 mm in stem diameter. ● Trees of very low quality which have poor structural and/or physiological condition and are not likely to be retained for more than 10 years in the current context. ● Woodlands in poor condition, poorly adapted to soils and/or climate, or significantly affected by pests, diseases or other abiotic factors. |

Table 8.C.1.3 Magnitude

| Magnitude of impact | Description of potential impact |
|----------------------------|---|
| High | A noticeable change to the tree population over a wide area or an intensive change over a limited area. |
| Medium | Small changes to the tree population over a wide area or noticeable change over a limited area. |
| Low | Very small changes to the tree population over a wide area or small changes over a limited area. |
| Negligible | No discernible change to the tree population. |

Table 8.C.1.4 Significance of effects

| | | Sensitivity of receptor/receiving environment to change/effect | | | |
|-----------------------------------|-------------------|---|-----------------|-----------------|-------------------|
| | | High | Medium | Low | Negligible |
| Magnitude of change/effect | High | Major | Major | Moderate | Negligible |
| | Medium | Major | Moderate | Minor | Negligible |
| | Low | Moderate | Minor | Minor | Negligible |
| | Negligible | Negligible | Negligible | Negligible | Negligible |

Arboricultural Impact Assessment

- 8.C.1.4.2 The impact of the Project will be assessed using the baseline arboricultural constraints and will be reported in an AIA report as an appendix to the Ecology and Biodiversity ES Chapter.
- 8.C.1.4.3 The AIA will consider the impacts of the Project on arboricultural features. The impacts will be assessed for all arboricultural features whether captured in the arboricultural walkover survey or the LiDAR canopy data. Impacts are adverse and permanent unless otherwise stated.
- 8.C.1.4.4 The significance of effects matrix based on sensitivity and magnitude will be used to establish the level of impacts. Due to the size of the Project, individual arboricultural features will not be assessed in terms of significance (e.g. T1), rather significance of effects will be assessed for a geographical area or by features with collective attributes.
- 8.C.1.4.5 The AIA will set out mitigation measures to reduce the impact on retained arboricultural features. Mitigation measures will feed into the outline CoCP.
- 8.C.1.4.6 Tree impacts will be shown indicatively on a Tree Impacts Plan.

Summary

- 8.C.1.4.7 The arboricultural walkover survey will have a focus on reporting impacts to high and moderate quality arboricultural features with their associated constraints used to inform design development where feasible.
- 8.C.1.4.8 The AIA will confirm the likely impacts on arboricultural features with figures spatially illustrating the extent of tree removal, potentially impacted and retained arboricultural features.

8.C.2 References

- Ref 8.C.1 Department of Energy and Climate Change (2011). National Policy Statement for Energy (EN-1). [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Accessed: 28.11.2022].
- Ref 8.C.2 National Grid. The Holford Rules: Guidelines on Overhead Line Routeing. [Online]. Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf> [Accessed: 15.05.2023].
- Ref 8.C.3 Department for Business, Energy and Industrial Strategy (2021). Draft National Policy Statement for Electricity Networks Infrastructure (EN-5). [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015238/en-5-draft-for-consultation.pdf [Accessed: 28.11.2022].
- Ref 8.C.4 National Grid. The Horlock Rules. [Online]. Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed: 23.11.2022].
- Ref 8.C.5 Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework. [Online]. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework-2#full-publication-update-history> [Accessed: 28.11.2022].
- Ref 8.C.6 East Riding of Yorkshire Council (2016). East Riding Local Plan 2012-2029 Strategy Document. [Online]. Available at: <https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/east-riding-local-plan/> [Accessed: 28.11.2022].
- Ref 8.C.7 North Lincolnshire Council (2011). North Lincolnshire Local Development Framework Core Strategy. [Online]. Available at: <https://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/#1591178700859-b856fc83-069c> [Accessed: 28.11.2022].
- Ref 8.C.8 Bassetlaw District Council (2011). Bassetlaw District Local Development Framework, Core Strategy and Development Management Policies DPD. [Online]. Available at: <https://www.bassetlaw.gov.uk/media/1543/cs1adoptedcorestrategy.pdf> [Accessed June 2023].
- Ref 8.C.9 Multi-Agency Geographic Information for the Countryside (MAGIC) website. [Online]. Available at: <https://magic.defra.gov.uk/> [Accessed: June, 2023].
- Ref 8.C.10 British Standards Institution (2012) Trees in Relation to Design, Demolition and Construction to Construction – Recommendations (BS 5837)

9.A Non- Designated Sites Recorded on the HERs within the Scoping Boundary

9.A.1 Non-Designated Assets

Table 9.A.1.1 Non-designated assets recorded on the Historic Environment Records (HER) within the Scoping Boundary

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|------------|---|-----------|--|---------------|
| Humber | 12794 | Building | Bottoms Road Bridge | Post-medieval |
| Humber | 14064 | Building | Woodale Farm | Post-medieval |
| Humber | 14488 | Building | School, Ousefleet | Post-medieval |
| Humber | 14487 | Building | Old Post Office, Ousefleet | Post-medieval |
| Humber | 13930 | Building | National School, Ringbeck Lane | Post-medieval |
| Humber | 20357 | Building | South Lodge, Ellerker | Post-medieval |
| Humber | 20333 | Building | Sebastepol Cottage and Inscribed Stone | Post-medieval |
| Humber | 20358 | Building | White House Farm, Ellerker | Post-medieval |
| Humber | 4943 | Building | Wind pump, Brickworks | Post-medieval |
| Humber | 12481 | Building | Former Primitive methodist chapel | Post-medieval |
| Humber | 20720 | Building | Bridge Farm | Post-medieval |
| Humber | 12622 | Building | Pigeoncote Farm | Post-medieval |
| Humber | 7845 | Building | Platwoods Farm, Beverley Road | Post-medieval |
| Humber | 20359 | Building | Property adjoining Elmsall House | Post-medieval |
| Humber | 12532 | Building | Walk Farm | Post-medieval |
| Humber | 20263 | Find Spot | Findspot of Roman brooch | Roman |
| Humber | 6652 | Find Spot | Mortar floor and inscribed lead pig | Roman |
| Humber | 3171 | Find Spot | Roman lead pig | Roman |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|---------------------------------------|-------------------|
| Humber | 22228 | Find Spot | Roman silver finger ring | Roman |
| Humber | 22747 | Find Spot | Roman silver finger ring fragment | Roman |
| Humber | 20175 | Find Spot | Flint scraper | Prehistoric |
| Humber | 20862 | Find Spot | Medieval silver finger ring | Medieval |
| Humber | 2959 | Find Spot | Medieval pottery | Medieval |
| Humber | 6648 | Find Spot | Romano-British settlement aite | roman |
| Humber | 3165 | Find Spot | Romano-British pottery | Roman |
| Humber | 10664 | Find Spot | Medieval sherds south of Main Street | Medieval |
| Humber | 1381 | Monument | Site of two round barrows | Bronze Age |
| Humber | 16584 | Monument | Site of C17 house, Wanless | Post-medieval |
| Humber | 12805 | Monument | Site of Dunflat Gate | Post-medieval |
| Humber | 9237 | Monument | Beverley-Skidby-Hessle Ferry Turnpike | Post-medieval |
| Humber | 12377 | Monument | Milestone On A164 | Post-medieval |
| Humber | 12382 | Monument | Pratwoods Gate | Post-medieval |
| Humber | 12530 | Monument | Oldgate Skidby To Bentley Road | Post-medieval |
| Humber | 6596 | Monument | Linear Earthwork | Prehistoric |
| Humber | 12532 | Monument | Walk Farm | Post-medieval |
| Humber | 6593 | Monument | Two round barrows | Bronze Age |
| Humber | 6595 | Monument | Ditch system, track and enclosure | Iron Age to Roman |
| Humber | 3531 | Monument | Enclosures | Iron Age to Roman |
| Humber | 1377 | Monument | Round barrow | Bronze Age |
| Humber | 7915 | Monument | Ditches | Unknown |
| Humber | 12773 | Monument | Milestone at Riplingham Cottage | Post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|--|---------------|
| Humber | 12423 | Monument | Site of Building, Ripplingham | Unknown |
| Humber | 12772 | Monument | Lamb Well | Unknown |
| Humber | 7515 | Monument | Trackways and Enclosures, north west of Field House Farm | Prehistoric |
| Humber | 13863 | Monument | Warren House, Woodale | Post-medieval |
| Humber | 6650 | Monument | Parallel ditches and trackway | Unknown |
| Humber | 14065 | Monument | Milestone | Post-medieval |
| Humber | 63 | Monument | Brough to York Roman Road | Roman |
| Humber | 725 | Monument | Site of Cockle Pits Roman Villa | Roman |
| Humber | 19555 | Monument | Site of stocks | Post-medieval |
| Humber | 12236 | Monument | Limestone quarry and limekiln | Post-medieval |
| Humber | 2955 | Monument | Medieval remains | Medieval |
| Humber | 13927 | Monument | Site of Ellerker Mill | Post-medieval |
| Humber | 14054 | Monument | Site of Engine House, Ellerker Mill | Post-medieval |
| Humber | 13928 | Monument | Fishponds, north east of Ellerker Manor | Post-medieval |
| Humber | 13929 | Monument | Ellerker Manor | Post-medieval |
| Humber | 13931 | Monument | Site of the New Inn | Post-medieval |
| Humber | 9580 | Monument | Ellerker medieval to post-medieval settlement | Medieval |
| Humber | 12238 | Monument | Site of pinfold | Post-medieval |
| Humber | 13932 | Monument | Summer House, Ellerker Hall | Post-medieval |
| Humber | 12239 | Monument | Site of well | Post-medieval |
| Humber | 22607 | Monument | Ridge and furrow | Medieval |
| Humber | 12609 | Monument | Bow Bridge | Medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|---|---------------|
| Humber | 6649 | Monument | Ditched field System | Unknown |
| Humber | 6631 | Monument | Three ring ditches | Bronze Age |
| Humber | 174 | Monument | Medieval flood banks | Medieval |
| Humber | 154 | Monument | Site of Provence hamlet | Post-medieval |
| Humber | 162 | Monument | Four ring ditches | Unknown |
| Humber | 6622 | Monument | Possible ring ditch | Prehistoric |
| Humber | 164 | Monument | Enclosures and ditches | Unknown |
| Humber | 159 | Monument | Ditch traces | Unknown |
| Humber | 170 | Monument | Site of mill dam drainage channel | Post-medieval |
| Humber | 12619 | Monument | Dovecote, Northfield House | Post-medieval |
| Humber | 171 | Monument | Site of Hodfleet drainage channel | Post-medieval |
| Humber | 163 | Monument | Ditches and enclosure | Unknown |
| Humber | 14502 | Monument | Site of brick and tile yard, Landing | Post-medieval |
| Humber | 157 | Monument | Pig Hills medieval occupation | Medieval |
| Humber | 14501 | Monument | Site of brick and tile works, Landing | Post-medieval |
| Humber | 12618 | Monument | The Red Lion public house, Main Street | Post-medieval |
| Humber | 12243 | Monument | Site of poorhouses | Post-medieval |
| Humber | 156 | Monument | Site of chapel, Broomfleet | Post-medieval |
| Humber | 74 | Monument | Site of Manor House | Post-medieval |
| Humber | 73 | Monument | Broomfleet Medieval to post-medieval settlement | Medieval |
| Humber | 153 | Monument | Site of smithy | Post-medieval |
| Humber | 91 | Monument | Site of windmill at Broomfleet | Post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|--|------------------------|
| Humber | 151 | Monument | Site of Culvert Or Bridge | Post-medieval |
| Humber | 12520 | Monument | Site of Wesleyan Methodist Chapel | Post-medieval |
| Humber | 14499 | Monument | Site of School, Sleights Lane | Post-medieval |
| Humber | 14500 | Monument | Outlet Bridge, Sleights Lane | Post-medieval |
| Humber | 167 | Monument | Enclosures, Thorpe Grange | Bronze Age to Iron Age |
| Humber | 8829 | Monument | Hull to Selby Railway | Post-medieval |
| Humber | 14503 | Monument | Brickworks, west side of Market Weighton Canal | Post-medieval |
| Humber | 14437 | Monument | Stone, Tongue Lane | Unknown |
| Humber | 2923 | Monument | Possible moated site, north of North Hall | Medieval |
| Humber | 14505 | Monument | North Hall | Post-medieval |
| Humber | 14504 | Monument | Sundial, North Hall | Post-medieval |
| Humber | 2915 | Monument | Two square barrows, Tongue Field | Iron Age |
| Humber | 2930 | Monument | Settlement complex | Iron Age |
| Humber | 2916 | Monument | Site of poor house | Post-medieval |
| Humber | 12925 | Monument | Site of poorhouses | Post-medieval |
| Humber | 2913 | Monument | Trackway and enclosures | Roman |
| Humber | 2933 | Monument | Staddlethorpe Broad Lane | Medieval |
| Humber | 2937 | Monument | Staddlethorpe DMV | Medieval |
| Humber | 14481 | Monument | East Lodge, Yokefleet Hall | Post-medieval |
| Humber | 14490 | Monument | Site of boathouse, Yokefleet Hall | Post-medieval |
| Humber | 14489 | Monument | Flagstaff, Yokefleet Hall | Post-medieval |
| Humber | 14486 | Monument | Site of poor houses, Ousefleet | Post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|--|-------------|--|-------------------------|
| Humber | 12898 | Monument | Ousefleet Mill, Narrow Lane | Post-medieval |
| Humber | 19639 | Monument | Site of a Church at Ellerker | Post-medieval |
| North Lincolnshire | 25187 | Building | Carr Lodge, Garthorpe and Fockerby | Post-medieval to modern |
| North Lincolnshire | 25203 | Building | Ox Pasture House (ox pasture), Luddington and Haldenby | Post-medieval to modern |
| North Lincolnshire | 25205 | Building | Carr House, Luddington and Haldenby | Post-medieval to modern |
| North Lincolnshire | 21428 | Building | Royal Observer Corps monitoring post | Modern |
| North Lincolnshire | 25227 | Building | Unnamed Farmstead, Eastoft | Post-medieval to modern |
| North Lincolnshire | 25233 | Building | Rose Cottage Farm, Eastoft | Post-medieval to modern |
| North Lincolnshire | 25232 | Building | Leam House, Eastoft | Post-medieval to modern |
| North Lincolnshire | 25239 | Building | Crowle Grange, Crowle and Ealand | Post-medieval to modern |
| North Lincolnshire | 25268 | Building | Ealand Grange, Crowle and Ealand | Post-medieval to modern |
| North Lincolnshire | 25267 | Building | Ealand Warpings, Crowle and Ealand | Post-medieval to modern |
| North Lincolnshire | 25266 | Building | North Pilfrey Farm, Crowle and Ealand | Post-medieval to modern |
| North Lincolnshire | 25289 | Building | Pilfrey Farm, Crowle and Ealand | Post-medieval to modern |
| North Lincolnshire | 25562 | Building | North Moor Farm, Belton | Post-medieval to modern |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|--|-------------|--|-------------------------|
| North Lincolnshire | 25462 | Building | Old Farm, Belton | Post-medieval to modern |
| North Lincolnshire | 25460 | Building | (Belwood Farm), Belton | Post-medieval to modern |
| North Lincolnshire | 25597 | Building | Woods Farm, Belton | Post-medieval to modern |
| North Lincolnshire | 25630 | Building | Epworth Grange, Epworth | Post-medieval to modern |
| North Lincolnshire | 25909 | Building | Former threshing barn and granary, High Melwood Farm | Post-medieval |
| North Lincolnshire | 25806 | Building | Owston Grange Farm, Owston Ferry | Post-medieval to modern |
| North Lincolnshire | 24942 | Building | Poplar Farm, Haxey | Post-medieval to modern |
| North Lincolnshire | 24952 | Building | Bridge Farm, Haxey | Post-medieval to modern |
| North Lincolnshire | 24829 | Building | Langholme Farm, Haxey | Post-medieval to modern |
| North Lincolnshire | 24830 | Building | Langholme Farm, Haxey | Post-medieval to modern |
| North Lincolnshire | 1343 | Find Spot | Flake and core/hammerstone, 1964 | Neolithic to Bronze Age |
| North Lincolnshire | 2496 | Find Spot | Flint blade | Neolithic |
| North Lincolnshire | 1342 | Find Spot | Romano British Greyware and mortarium sherds, Pademoor, 1974 | Roman |
| North Lincolnshire | 20060 | Find Spot | Post-medieval pottery, OS 0006 'Field 1' | Post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|--|-------------|--|--------------------------------|
| North Lincolnshire | 20059 | Find Spot | Flint tools and debitage, OS 0006 'Field 1' | Mesolithic to Early Bronze Age |
| North Lincolnshire | 20063 | Find Spot | Flint core, OS 0006 'Field 3' | Mesolithic to Early Bronze Age |
| North Lincolnshire | 20064 | Find Spot | Roman, medieval and post-medieval pottery, OS 0006 'Field 3' | Roman to post-medieval |
| North Lincolnshire | 20062 | Find Spot | Medieval and post-medieval pottery, OS 0006 'Field 2' | Medieval to post-medieval |
| North Lincolnshire | 20061 | Find Spot | Flint tools and debitage, OS 0006 'Field 2' | Mesolithic to Early Bronze Age |
| North Lincolnshire | 17390 | Find Spot | Post-medieval pottery, west of Crowle Grange | Medieval to post-medieval |
| North Lincolnshire | 2505 | Find Spot | Flint core | Neolithic to Bronze Age |
| North Lincolnshire | 17548 | Find Spot | Worked flint, south of Bewcarrs Drain | Neolithic to Bronze Age |
| North Lincolnshire | 2499 | Find Spot | Flint flakes, 1964 | Neolithic to Bronze Age |
| North Lincolnshire | 2497 | Find Spot | Flint scrapers and flakes, 1964 | Mesolithic to Early Bronze Age |
| North Lincolnshire | 933 | Find Spot | Flint flakes and Romano British and medieval sherds, 1975 | Mesolithic to Medieval |
| North Lincolnshire | 19446 | Find Spot | Flint knife and debitage | Neolithic |
| North Lincolnshire | 17356 | Find Spot | Romano-British pottery, north of Mill Hill | Roman |
| North Lincolnshire | 924 | Find Spot | Stone axe and arrowhead, Temple Belwood Farm | Neolithic to Bronze Age |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|--|-------------|---|----------------------------|
| North Lincolnshire | 942 | Find Spot | Flint flakes, medieval and post-medieval sherds | Neolithic to post-medieval |
| North Lincolnshire | 21805 | Find Spot | Roman and medieval Pottery | Roman to medieval |
| North Lincolnshire | 910 | Find Spot | Medieval and post-medieval sherds | Medieval to post-medieval |
| North Lincolnshire | 21803 | Find Spot | Roman pottery, Beltoft | Roman |
| North Lincolnshire | 20534 | Find Spot | Medieval/post-medieval pottery, OS 0004 | Medieval to post-medieval |
| North Lincolnshire | 943 | Find Spot | Flint flakes, Romano British sherd, 1974 | Neolithic to Roman |
| North Lincolnshire | 17352 | Find Spot | Flint, pottery sherds, south of Mill Hill | Neolithic to post-medieval |
| North Lincolnshire | 20533 | Find Spot | Small flint assemblage, OS 0004 | Neolithic to Bronze Age |
| North Lincolnshire | 19890 | Find Spot | Retouched flake, OS 1107 | Neolithic to Bronze Age |
| North Lincolnshire | 939 | Find Spot | Flint flakes and scrapers, 1975 | Neolithic |
| North Lincolnshire | 17367 | Find Spot | Neolithic flint, west of Gurry Lane | Neolithic |
| North Lincolnshire | 925 | Find Spot | Flint axe, Danes Hill | Neolithic |
| North Lincolnshire | 19888 | Find Spot | Flint assemblage, OS 0948 | Neolithic to Bronze Age |
| North Lincolnshire | 19889 | Find Spot | Pottery assemblage, OS 0948 | Roman to Modern |
| North Lincolnshire | 19975 | Find Spot | Pottery assemblage, OS 990 | Roman to post-medieval |
| North Lincolnshire | 929 | Find Spot | Flint flakes, 1974 | Neolithic |
| North Lincolnshire | 20493 | Find Spot | Medieval to post medieval pottery, OS Parcel 1900 | Medieval to post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|--|-------------|---|--------------------------------|
| North Lincolnshire | 20523 | Find Spot | Pottery assemblage, OS Parcel 6583, Beltoft | Medieval to modern |
| North Lincolnshire | 20522 | Find Spot | Flint assemblage, OS Parcel 6583, Beltoft | Mesolithic to Late Neolithic |
| North Lincolnshire | 17535 | Find Spot | Flint implements, north-east of Belgraves Wood | Neolithic to Bronze Age |
| North Lincolnshire | 936 | Find Spot | Flint flake, 1964 | Neolithic to Bronze Age |
| North Lincolnshire | 908 | Find Spot | Romano British and Anglo-Saxon sherds, 1975-6 | Roman to medieval |
| North Lincolnshire | 20500 | Find Spot | Roman, medieval and post-medieval pottery, OS Parcel 1534 | Roman to post-medieval |
| North Lincolnshire | 20499 | Find Spot | Small flint assemblage, OS Parcel 1534 | Mesolithic to Early Bronze Age |
| North Lincolnshire | 20179 | Find Spot | Roman, medieval, post-medieval pottery, OS 3911 | Roman to post-medieval |
| North Lincolnshire | 20178 | Find Spot | Flint assemblage, OS 3911 | Prehistoric |
| North Lincolnshire | 17514 | Find Spot | Possible crest holder, east of Epworth | Post-medieval |
| North Lincolnshire | 17428 | Find Spot | Romano British disc brooch, south-west of High Melwood | Roman |
| North Lincolnshire | 19897 | Find Spot | Flint assemblage, OS 2549 | Neolithic to Bronze Age |
| North Lincolnshire | 19900 | Find Spot | Pottery assemblage, OS 2549 | Medieval to modern |
| North Lincolnshire | 17427 | Find Spot | Medieval ampulla, South-west of Low Melwood Farm | Medieval |
| North Lincolnshire | 19898 | Find Spot | Stone axe fragment, OS 2549 | Neolithic |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|---|-----------|---|---------------------------|
| North Lincolnshire | 17314 | Find Spot | Rb Sherds, N of Burnham Lane, 1988 | Roman |
| North Lincolnshire | 2477 | Find Spot | Roman Coin Hoard, 1952 | Roman |
| North Lincolnshire | 19657 | Find Spot | Medieval coin, east of High Burnham | Medieval |
| North Lincolnshire | 17429 | Find Spot | Anglo-Saxon and Roman finds, north of Owston Ferry | Roman to medieval |
| North Lincolnshire | 17430 | Find Spot | Romano British and medieval pottery, south-west of Low Melwood Farm | Roman to medieval |
| North Lincolnshire | 17426 | Find Spot | Coin of Edward III, north of Low Hall Farm | Medieval |
| North Lincolnshire | 20498 | Find Spot | Roman, medieval and post-medieval pottery, OS Parcel 4700 | Roman to post-medieval |
| North Lincolnshire | 19331 | Find Spot | Flint find spot | Neolithic to Bronze Age |
| North Lincolnshire | 19333 | Find Spot | Flint find spot | Neolithic to Bronze Age |
| North Lincolnshire | 19332 | Find Spot | Flint find spot | Neolithic to Bronze Age |
| North Lincolnshire | 19334 | Find Spot | Flint find spot | Neolithic to Bronze Age |
| North Lincolnshire | 19330 | Find Spot | Flint find spot | Neolithic to Bronze Age |
| North Lincolnshire | 21474 | LND | Temple Belwood Park | Post-medieval |
| North Lincolnshire | 10735 | LND | Ridge and furrow, north and north-west of Belton Village | Medieval |
| North Lincolnshire | 7911 | LND | Open field system, Belton | Medieval to post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|---|----------|---|---------------------------|
| North Lincolnshire | 21561 | LND | Park (site of) associated with High Melwood Hall | Medieval to post-medieval |
| North Lincolnshire | 15778 | Monument | Adlingfleet drain | Post-medieval |
| North Lincolnshire | 11038 | Monument | Ditches and old field boundaries (cm) | Unknown |
| North Lincolnshire | 1349 | Monument | Circular moated site (cm) | Medieval |
| North Lincolnshire | 1348 | Monument | 'Fockerby Mount' moated site | Medieval |
| North Lincolnshire | 15417 | Monument | Warping drains, Haldenby Moor and Haldenby Common | Post-medieval |
| North Lincolnshire | 9488 | Monument | Old River Don | Post-medieval |
| North Lincolnshire | 21140 | Monument | Cropmarks, west of Carr Lane | Unknown |
| North Lincolnshire | 21043 | Monument | Linear cropmarks, east of Luddington | Post-medieval |
| North Lincolnshire | 15423 | Monument | Old field boundaries and ridge and furrow | Medieval to post-medieval |
| North Lincolnshire | 15422 | Monument | Linear soilmarks | Post-medieval |
| North Lincolnshire | 25204 | Monument | Site of unnamed outfarm, Luddington and Haldenby | Post-medieval to modern |
| North Lincolnshire | 20873 | Monument | Warping drain, east of Washinghall Lane | Post-medieval |
| North Lincolnshire | 20872 | Monument | Cropmark south of Washinghall Lane | Post-medieval |
| North Lincolnshire | 20600 | Monument | Enclosure (cm), south of Eastoft | Unknown |
| North Lincolnshire | 15420 | Monument | Drainage/old field boundaries (sm) | Medieval to post-medieval |
| North Lincolnshire | 15424 | Monument | Soilmarks | Post-medieval |
| North Lincolnshire | 20923 | Monument | Cropmark complex, north of Pauper'S Drain | Post-medieval |
| North Lincolnshire | 21529 | Monument | Ring ditch, Leam House | Unknown |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|---|----------|---|---------------------------|
| North Lincolnshire | 20919 | Monument | Cropmark trackway and enclosure, Pademoor | Roman |
| North Lincolnshire | 20920 | Monument | Oval cropmark, north of Grange Dyke | Unknown |
| North Lincolnshire | 17470 | Monument | Warping drains, east of Crowle Grange | Post-medieval |
| North Lincolnshire | 22528 | Monument | Cropmark of curvilinear ditches | Unknown |
| North Lincolnshire | 20926 | Monument | Cropmark, north-east of Crowle Grange | Unknown |
| North Lincolnshire | 20929 | Monument | Enclosure, east of Field Road | Iron Age to Roman |
| North Lincolnshire | 20928 | Monument | Linear cropmarks, OS 0006 | Unknown |
| North Lincolnshire | 22011 | Monument | Bonny Hale brick field (site of) | Post-medieval to modern |
| North Lincolnshire | 19587 | Monument | New River Torne | Post-medieval |
| North Lincolnshire | 19588 | Monument | South Engine Drain | Post-medieval |
| North Lincolnshire | 21088 | Monument | Former warping drain, North Moor | Post-medieval |
| North Lincolnshire | 18540 | Monument | Cropmarks, North Moor | Unknown |
| North Lincolnshire | 6379 | Monument | Belwood Farm (site of), Belwood | Post-medieval |
| North Lincolnshire | 906 | Monument | Temple Belwood, camera of Knights Templar (site of) | Medieval |
| North Lincolnshire | 12743 | Monument | Mill (site of), Mill Hill | Post-medieval |
| North Lincolnshire | 902 | Monument | Rectangular soilmark and ridge and furrow, west of Mill Hill Wood | Medieval |
| North Lincolnshire | 19600 | Monument | Circular soilmark | Medieval to post-medieval |
| North Lincolnshire | 19447 | Monument | Flint scatter | Neolithic |
| North Lincolnshire | 21027 | Monument | Cropmark enclosure, north of Gurry Lane | Iron Age to Roman |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|---|----------|--|---------------------------|
| North Lincolnshire | 21032 | Monument | Cropmark, north of Sealings Wood | Post-medieval |
| North Lincolnshire | 20220 | Monument | Cropmark complex, west of Butterwick Grange | Iron Age to Roman |
| North Lincolnshire | 21091 | Monument | Cropmark, east of Kelfield Catchwater | Unknown |
| North Lincolnshire | 25631 | Monument | Site of Cowsitt Hill, Epworth | Post-medieval to modern |
| North Lincolnshire | 2454 | Monument | Rectangular enclosures (cm) | Unknown |
| North Lincolnshire | 21016 | Monument | Cropmarks, south of Narrow Lane | Unknown |
| North Lincolnshire | 21017 | Monument | Cropmark, south-east of Epworth Grange | Unknown |
| North Lincolnshire | 21018 | Monument | Cropmarks, south-east of Epworth Grange | Unknown |
| North Lincolnshire | 10561 | Monument | Retting pits (cm), Epworth | Medieval to post-medieval |
| North Lincolnshire | 20909 | Monument | Cropmark, north of Broad Lane Farm | Unknown |
| North Lincolnshire | 2480 | Monument | 'Giants Graves', possible long barrows (site of) | Neolithic |
| North Lincolnshire | 19314 | Monument | Cropmarks, High Melwood | Medieval |
| North Lincolnshire | 20177 | Monument | Enclosure, High Melwood | Iron Age |
| North Lincolnshire | 21560 | Monument | Moated site (site of), High Melwood | Medieval |
| North Lincolnshire | 19899 | Monument | Roman settlement, OS 2549 | Roman |
| North Lincolnshire | 18437 | Monument | World War II decoy (site of) | modern |
| North Lincolnshire | 2532 | Monument | Retting pits, east of East Lound | Medieval |
| North Lincolnshire | 20885 | Monument | Linear cropmark | Unknown |
| North Lincolnshire | 20222 | Monument | Cropmarks, east of Carr Lane | Post-medieval |
| North Lincolnshire | 20886 | Monument | Warping drains (site of), east of Carr Lane | Post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|--------------------|---|----------|---|-------------------------|
| North Lincolnshire | 18376 | Monument | Ditches, retting pits (cm), east of Lound Rates Drain | Post-medieval |
| North Lincolnshire | 2541 | Monument | Linear soilmarks | Unknown |
| North Lincolnshire | 18376 | Monument | Ditches, retting pits (cm), east of Lound Rates Drain | Post-medieval |
| North Lincolnshire | 20884 | Monument | Warping drain (site of), Owston Grange | Post-medieval |
| North Lincolnshire | 2435 | Monument | Linear features, enclosure, ring ditches (cm) | Unknown |
| North Lincolnshire | 10730 | Monument | Enclosures (cm), alongside Ferry Drain | Post-medieval |
| North Lincolnshire | 10731 | Monument | Ditches (cm), south-east of Graiselound | Unknown |
| North Lincolnshire | 20992 | Monument | Cropmarks, south of Graiselound | Unknown |
| North Lincolnshire | 20355 | Monument | Undated linear feature | Unknown |
| North Lincolnshire | 19399 | Monument | Flint scatter | Bronze Age |
| North Lincolnshire | 20887 | Monument | Cropmark complex, Bridge Farm | Unknown |
| North Lincolnshire | 7910 | Monument | Axholme Joint Railway (line of) | Post-medieval to modern |
| North Lincolnshire | 7161 | Monument | Oak Statue, 1802 | Roman |
| Nottinghamshire | 10848 | Building | Manor Farmhouse and outbuildings | Modern |
| Nottinghamshire | 10851 | Building | Highfield Farmhouse | Modern |
| Nottinghamshire | 11943 | Building | Pigeoncote and fodder store at Pear Tree Hill Farm | Modern |
| Nottinghamshire | 17623 | Building | Hardings Farm | Modern |
| Nottinghamshire | 18448 | Building | Field Farm barn | Modern |
| Nottinghamshire | 11459 | Building | Field Farmhouse | Modern |
| Nottinghamshire | 18489 | Building | Far Hill Farm barn | Modern |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|---|---------------------------|
| Nottinghamshire | 18491 | Building | Field Farm barn | Modern |
| Nottinghamshire | 18483 | Building | North Farm barn | Modern |
| Nottinghamshire | 15560 | Building | Top Farmhouse and outbuildings | Modern |
| Nottinghamshire | 17629 | Building | Gibraltar Farm | Modern |
| Nottinghamshire | 18484 | Building | Fledborough House farm barn | Modern |
| Nottinghamshire | 15531 | Building | Fledborough House and outbuildings | Modern |
| Nottinghamshire | 5138 | Monument | Rectangular mound at Misterton | Unknown |
| Nottinghamshire | 12548 | Monument | Structure of New Haxey Gate Bridge, Misterton | Modern |
| Nottinghamshire | 12547 | Monument | Structure of Haxey Gate Bridge, Misterton | Post-medieval to modern |
| Nottinghamshire | 12546 | Monument | Map depiction of Haxey Gate Bridge, Misterton | Post-medieval |
| Nottinghamshire | 10257 | Monument | Cropmark complex at Misterton | Unknown |
| Nottinghamshire | 10258 | Monument | Ditch at Misterton | Unknown |
| Nottinghamshire | 10256 | Monument | Circular enclosure at Misterton | Unknown |
| Nottinghamshire | 10255 | Monument | Large enclosure at Misterton | Unknown |
| Nottinghamshire | 10254 | Monument | Large enclosure at Misterton | Unknown |
| Nottinghamshire | 6220 | Monument | Ring ditch, Misterton | Unknown |
| Nottinghamshire | 6221 | Monument | Enclosures, Misterton | Unknown |
| Nottinghamshire | 6251 | Monument | Tunnel Drain/Carr Ings Drain | Modern |
| Nottinghamshire | 5135 | Find Spot | Roman finds from Gringley On The Hill | Roman |
| Nottinghamshire | 10313 | Monument | Ridge and furrow at Beckingham | Medieval to post-medieval |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|---|---------------------------|
| Nottinghamshire | 4992 | Find Spot | Roman finds from Saundby | Roman |
| Nottinghamshire | 4991 | Find Spot | Roman finds from Saundby | Roman |
| Nottinghamshire | 10244 | Monument | Ridge and furrow at Bole | Medieval to post-medieval |
| Nottinghamshire | 5029 | Find Spot | Roman coin from North Wheatley | Roman |
| Nottinghamshire | 4656 | Monument | Map depiction of windmill, East Drayton | Modern |
| Nottinghamshire | 10021 | Monument | Bank at East Drayton | Unknown |
| Nottinghamshire | 5761 | Monument | Burials at Ragnall | Medieval |
| Nottinghamshire | 6766 | Monument | Bank at Fledborough | Unknown |
| Nottinghamshire | 10112 | Monument | Scarp at Ragnall | Unknown |
| Nottinghamshire | 10113 | Monument | Hollow at Ragnall | Unknown |
| Nottinghamshire | 10114 | Monument | Bank at Ragnall | Unknown |
| Nottinghamshire | 10115 | Monument | Earthwork at Fledborough | Unknown |
| Nottinghamshire | 5857 | Monument | Bank at Fledborough | Post-medieval to modern |
| Nottinghamshire | 5858 | Monument | Bank at Fledborough | Post-medieval to modern |
| Nottinghamshire | 6807 | Monument | Map depiction of railway station at Marnham | Modern |
| Nottinghamshire | 8853 | Monument | Map depiction of signal box at Fledborough | Modern |
| Nottinghamshire | 8854 | Monument | Map depiction of goods shed at Fledborough | Modern |
| Nottinghamshire | 4702 | Monument | Enclosure at Marnham | Unknown |
| Nottinghamshire | 4730 | Find Spot | Roman coin from Marnham | Roman |
| Nottinghamshire | 5131 | Monument | Cropmark complex at Gringley On The Hill | Unknown |
| Nottinghamshire | 6213 | Monument | Earthworks at Darlton | Unknown |

| HER Source | Historic Environment Record (HER) Reference | Type | Asset | Period |
|-------------------|--|-------------|---------------------------------------|-------------------------|
| Nottinghamshire | 6766 | Monument | Bank at Fledborough | Unknown |
| Nottinghamshire | 18168 | Monument | Roman settlement at Misterton | Roman |
| Nottinghamshire | 18167 | Monument | Bronze Age round barrow at Misterton | Bronze Age |
| Nottinghamshire | 18166 | Monument | Roman marching camp at Misterton | Roman |
| Nottinghamshire | 18165 | Monument | Roman marching camp at Misterton | Roman |
| Nottinghamshire | 6220 | Monument | Possible Bronze Age barrow, Misterton | Bronze Age |
| Nottinghamshire | 18172 | Monument | Roman settlement at Walkeringham | Roman |
| Nottinghamshire | 5131 | Monument | Settlement at Gringley On The Hill | Unknown |
| Nottinghamshire | 4656 | Monument | Site of windmill at East Drayton | Modern |
| Nottinghamshire | 5761 | Monument | Cemetery at Ragnall | Medieval |
| Nottinghamshire | 18152 | Monument | Possible quarry at Ragnall | Unknown |
| Nottinghamshire | 18153 | Monument | Possible Ha Ha at Fledborough | Unknown |
| Nottinghamshire | 5857 | Monument | Flood bank at Fledborough | Post-medieval to modern |
| Nottinghamshire | 5858 | Monument | Flood bank at Fledborough | Post-medieval to modern |
| Nottinghamshire | 6807 | Monument | Railway Station at Marnham | Modern |
| Nottinghamshire | 8853 | Monument | Signal box at Fledborough | Modern |
| Nottinghamshire | 8854 | Monument | Goods shed at Fledborough | Modern |

10.A Proposed Water Framework Regulations Assessment Methodology

Contents

| | | |
|---------------|---------------------|----------|
| 10.A.1 | Introduction | 1 |
| 10.A.1.1 | Overview | 1 |
| 10.A.1.2 | Proposed Assessment | 1 |
| | | |
| 10.A.2 | References | 3 |

10.A.1 Water Framework Regulations Assessment Methodology

10.A.1.1 Introduction

10.A.1.1.1 This appendix sets out the intended approach to undertaking a Water Framework Directive (WFD) Assessment for the North Humber to High Marnham Project (the Project). It presents information on intended Zones of Influence (Zol), sets out guidance to be followed, sources of baseline data, and describes the approach to assessing the Project activities on waterbodies without a WFD status. It concludes with a description of the intended approach to reporting the assessment.

10.A.1.2 Proposed Assessment

Zones of Influence

10.A.1.2.1 The study area for a WFD assessment is defined by a Zol. Zol's are set following consideration of the nature, scale and duration of Project construction and operational activities. The Zol's proposed for the Water Framework Regulations (WFR) assessment have also been selected to be consistent with other recent similar linear Development Consent Order (DCO) projects e.g. Bramford to Twinstead Reinforcement.

10.A.1.2.2 The proposed Zol will encompass surface and groundwater bodies situated within 500 m of the (not yet defined) draft Order Limits. In addition, protected areas with a surface or groundwater dependency within 500 m of the draft Order Limits will be included in the scope of the assessment.

Guidance

10.A.1.2.3 The assessment will draw on guidance published by the Environment Agency and the Planning Inspectorate, namely:

- Protecting and improving the water environment – WFD compliance of physical works in rivers. Doc No. 488_10 (Environment Agency, 2016)
- Advice Note 18: The Water Framework Directive (Planning Inspectorate, 2017).

Definition of Baseline Studies

10.A.1.2.4 The baseline status of waterbodies within the Zol will be characterised using the following data sources:

- Catchment Data Explorer;
- Humber River Basin Management Plan 2022 update; and
- Notes and photographs from ecology field surveys.

- 10.A.1.2.5 The River Basin Management Plan will also be reviewed to collect information on Reasons for Not Achieving Good status, and for details of objectives and planned measures for waterbodies within the Zol.

Assessment of Project Activities on Waterbodies without a WFD Status

- 10.A.1.2.6 It is anticipated that watercourses that are not designated WFD waterbodies (with a Waterbody ID) but are located within WFD operational catchments and drain to WFD waterbodies will be crossed by the Project.
- 10.A.1.2.7 Potential effects on these watercourses will be considered cumulatively within the WFD assessment, with effects on the WFD waterbody to include the indirect effects associated with works to its 'non designated' tributaries. This is a precedented approach that has been applied to other recent similar linear DCO projects e.g. Bramford to Twinstead Reinforcement.

Approach to Reporting

- 10.A.1.2.8 It is proposed to undertake the WFD Assessment in four stages:
- Stage 1 – identify the WFD waterbodies and protected areas within the Zol and screen them for the potential to be impacted by Project activities, based on the source-pathway-receptor principle.
 - Stage 2 – define the baseline status, objectives and measures for screened-in waterbodies.
 - Stage 3 – screen Project activities (construction and operation) and identify embedded and good practice measures (to be secured by Project commitments within the Code of Construction Practice) that reduce potential for deterioration of screened-in waterbodies.
 - Stage 4 – assess the effects of screened-in Project activities on screened-in waterbodies.
- 10.A.1.2.9 It is proposed to share reporting on the findings of each stage of the assessment with the Environment Agency for review, providing the opportunity to address any comments, prior to moving to the next stage of assessment, with the aim of agreeing all matters prior to the DCO submission.

10.A.2References

- Ref 10.A.1 Environment Agency (2016). Protecting and improving the water environment – WFD compliance of physical works in rivers. Doc No. 488_10.
- Ref 10.A.2 Planning Inspectorate (2017). Advice Note 18: The Water Framework Directive. [Online]. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/> [Accessed: 25.07.2023].

10.B Proposed Flood Risk Assessment Methodology

Contents

| | | |
|---------------|---------------------|----------|
| 10.B.1 | Introduction | 1 |
| 10.B.1.1 | Overview | 1 |
| 10.B.1.2 | Proposed Assessment | 1 |
| 10.B.2 | References | 4 |

10.B.1 Introduction

10.B.1.1 Overview

10.B.1.1.1 This appendix sets out the approach to preparing a Flood Risk Assessment (FRA) for the North Humber to High Marnham Project ('the Project'). It presents information on the sources of flood risk to be assessed, sets out policy and guidance to be followed, sources of baseline data, and describes the approach to assessing flood risk to the Project and arising from the Project during its construction and operation. It concludes with a description of the intended approach to reporting the assessment.

10.B.1.2 Proposed Assessment

Sources of Flood Risk

10.B.1.2.1 It is intended that the FRA will assess flood risk from the following sources, during both construction and operation of the Project:

- fluvial;
- tidal;
- pluvial (including effects on retained existing agricultural drainage or the removal of this as a result of the construction of the Project); and
- groundwater.

10.B.1.2.2 It is considered that the Project would be of low vulnerability to flooding from sewers and reservoirs and it is therefore proposed that these sources can be scoped out of the Environmental Statement (ES) and its accompanying FRA.

Policy and Guidance

10.B.1.2.3 The FRA will be prepared to fulfil the requirements set out in the Overarching NPS for Energy EN-1 (Ref 10.B.1) and EN-5 (Ref 10.B.2) (inclusive of any new or different obligations in the emerging updates to these documents – currently the 2023 revised drafts).

10.B.1.2.4 The assessment would draw on guidance provided in the Flood Risk and Coastal Change Planning Practice (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, 2022) (Ref 10.B.3), in particular with reference to the requirement for the FRA to assess future flood risk to and arising from the project over a 75 year development lifetime.

Sources of Baseline Data

10.B.1.2.5 It is proposed that the FRA would be informed by existing published flood data sets and reports, including, where applicable, outputs from Environment Agency flood

models. Given the nature of the Project, it is not considered that any surveys or new modelling would be required to generate information to inform the FRA.

10.B.1.2.6 Key sources of information will include:

- online flood maps (Environment Agency, 2023);
- Strategic Flood Risk Assessments and Surface Water Management plans prepared on behalf of the host local authorities;
- flood modelling outputs (flood extent, depth and hazard data);
- site topography data from LiDAR;
- historical flooding records held by the Environment Agency and lead local flood authorities (LLFAs);
- flood defence data from the Environment Agency AIMS database; and
- land drainage information from relevant Internal Drainage Boards (IDBs).

10.B.1.2.7 Flood risk management and mitigation measures will be informed by LLFA policies and published Sustainable Drainage (SuDS) guidance, and in consultation with the Environment Agency and LLFAs.

FRA Approach

10.B.1.2.8 It is proposed that the FRA will assess flood risk to the Project and arising from the Project during both construction and operation. During construction, vulnerable Project components include construction compounds, drive/reception pits associated with underground sections of the route, temporary soil storage and laydown areas and temporary haul roads. The FRA will characterise flood risk to these elements and assess the potential effects of temporary watercourse crossings and crossings of flood defences.

10.B.1.2.9 The FRA will set out Project commitments to the management of surface water runoff from construction compounds and describe Emergency Flood Incident Response procedures.

10.B.1.2.10 During operation of the Project the FRA will focus on any permanent above ground infrastructure e.g., cable sealing end compounds and will consider the potential effects of climate change on rainfall intensity and peak river flows/tide levels over a 75 year development lifetime. Residual flood risk will be assessed where applicable and the FRA will describe operational surface water drainage proposals.

10.B.1.2.11 The FRA will set out Project commitments to manage and mitigate any flood risk impacts of the operational phase.

Reporting

10.B.1.2.12 It is proposed to report the FRA in the following four stages:

- Stage 1 – baseline flood risk;
- Stage 2 – FRA for Project construction;
- Stage 3 – FRA for Project operation; and

- Stage 4 – flood risk management and mitigation measures and FRA conclusions.

10.B.1.2.13 It is proposed to share reporting on the findings of each stage of the assessment with the Environment Agency and LLFAs for review, providing for the opportunity to address any comments, prior to moving to the next stage of assessment, with the aim of agreeing all matters prior to the submission of the Development Consent Order (DCO) application.

10.B.2References

- Ref 10.B.1 Department of Energy and Climate Change (2011). National Policy Statement for Energy (EN-1). [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Accessed: 28.11.2022].
- Ref 10.B.2 Department of Energy and Climate Change (2011). National Policy Statement for Electricity Networks Infrastructure (EN-5). [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf [Accessed: 28.11.2022].
- Ref 10.B.3 Department for Levelling Up, Housing and Communities (2022). Flood Risk and Coastal Change. [Online]. Available at: <https://www.gov.uk/guidance/flood-risk-and-coastal-change> [Accessed: 25.07.2023].

11.A Preliminary Contamination Risk Assessment

Contents

| | | |
|---------------|---|-----------|
| 11.A.1 | Introduction | 1 |
| 11.A.1.1 | Overview | 1 |
| 11.A.1.2 | Structure of the Appendix | 1 |
| 11.A.1.3 | Source of Information | 1 |
| 11.A.2 | Methodology | 3 |
| 11.A.2.1 | Introduction | 3 |
| 11.A.2.2 | Initial Assessment | 3 |
| 11.A.2.3 | Further Assessment | 4 |
| 11.A.3 | Preliminary Contamination Assessment | 8 |
| 11.A.3.1 | Initial Assessment | 8 |
| 11.A.3.2 | Further Assessment | 20 |
| 11.A.4 | References | 53 |

11.A.1 Introduction

11.A.1.1 Overview

11.A.1.1.1 This preliminary contamination risk assessment has been produced to inform **Chapter 11, Geology and Hydrogeology** of the Scoping Report for North Humber to High Marnham. This appendix has been prepared to provide baseline information on potentially contaminated land within the study area.

11.A.1.1.2 As described in **Chapter 11, Geology and Hydrogeology** of the Scoping Report, the study area for land contamination comprises the physical extents of the Scoping Boundary plus a buffer zone of 250 m.

11.A.1.2 Structure of the Appendix

11.A.1.2.1 The structure of this assessment is as follows:

- Section 11.A.2 Methodology – presents information on the methodology followed in this chapter and the accompany classification table; and
- Section 11.A.3 Preliminary Contamination Assessment – presents a desk-based review of readily available historical Ordnance Survey (OS) maps supplemented by reference to earlier maps where available and historical aerial imagery. The chapter includes a qualitative Tier 1 preliminary contamination risk assessment using a Conceptual Site Model to identify 'source-pathway-receptor' linkages to assess the potential risk and hazards, if any, associated with existing contamination in the ground.

11.A.1.3 Sources of Information

11.A.1.3.1 The following primary sources of information were used in the compilation of this assessment:

- British Geological Survey (BGS) 1:50,000 scale geological mapping;
- BGS GeoIndex Viewer (Ref 11.A.1);
- Defra mapped information, via the MAGIC website (Ref 11.A.2) for Source Protection Zones (SPZ), aquifer designations, hydrological features, groundwater vulnerability, drinking water safeguard zones and statutory designated sites;
- the Environment Agency datasets for the locations for historical landfills (Ref 11.A.3) and permitted landfill and waste sites (Ref 11.A.4), and category 1 and 2 pollution incidents (Ref 11.A.5);
- historical mapping from the National Library of Scotland (Ref 11.A.6);
- Google Earth Historical Aerial Imagery;
- historical aerial photography from Britain from Above (Ref 11.A.7); and

- information on potentially contaminated land provided from East Riding of Yorkshire Council, North Lincolnshire Council and Bassetlaw District Council.

11.A.2 Methodology

11.A.2.1 Introduction

11.A.2.1.1 The assessment of land contamination within the Scoping Boundary has been undertaken following a staged approach as recommended by the guidance provided in Land Contamination Risk Management (LCRM) (Ref 11.A.8). This presents a three-stage process to the management of contaminated land.

- Stage 1 – risk assessment.
- Stage 2 – options appraisal.
- Stage 3 – remediation.

11.A.2.1.2 The Stage 1 risk assessment is undertaken in a phased manner comprising three tiers, as follows:

- Tier 1 – Preliminary Risk Assessment (PRA) – a qualitative assessment of historical and published information in order to develop a preliminary conceptual site model to inform a preliminary risk assessment;
- Tier 2 – Generic Risk Assessment – a quantitative assessment using published criteria to screen site specific ground condition data; and
- Tier 3 – Detailed Risk Assessment – a quantitative assessment involving the generation of site-specific assessment criteria.

11.A.2.1.3 This appendix provides a PRA (Tier 1) of ground conditions for the Project and identifies locations where there is potential for significant sources of contamination. The results of the PRA form the basis for the baseline conditions and assessment within the Environmental Impact Assessment Scoping Report **Chapter 11, Geology and Hydrogeology**.

11.A.2.2 Initial Assessment

11.A.2.2.1 The first stage of the PRA was to undertake an initial assessment to determine potential locations for existing sources of contamination within the study area (**Volume 2, Figure 11.1**). These were identified based on the historical and current land use information determined from a variety of information sources including historical ordnance survey mapping and aerial imagery.

11.A.2.2.2 The sites were then given a classification score representing their potential for generating contamination that could impact on identified receptors. The criteria used in this assessment for classifying hazards/potential for generating contamination is presented in **Table 11.A.1**, which has been developed using the guidance within LCRM (Ref 11.A.8).

Table 11.A.1– Criteria for Classifying the Potential for Generating Contamination

| Classification score | Potential for generating contamination |
|-----------------------------|--|
| Very Low | Land use examples: residential, retail or office use, agricultural. |
| Low | Land use examples: recent small scale industrial and light industry. |
| Moderate | Land use examples: railway yards, collieries, scrap yards, inert landfills. |
| High | Land use examples: heavy industry, non-hazardous landfills, hazardous landfills. |
| Very High | Land use examples: hazardous landfills, large gas works, chemical works. |

11.A.2.2.3 Sites/areas that are classified as having a very low or low potential for generating contamination are scoped out of further assessment on the basis that there is no significant contamination source and therefore no source-pathway-receptor pollutant linkage (see section 11.A.2.3) which could result in significant effects.

11.A.2.2.4 Sites/areas that are identified as having a moderate or above potential for generating contamination have been taken forward for further assessment.

11.A.2.2.5 This approach has been undertaken as it is considered to be proportionate for the scale of the project and the activities that will be undertaken and allows a targeted approach as required by EIA Regulations.

11.A.2.3 Further Assessment

11.A.2.3.1 The sites taken forward for further assessment have been assessed as having a moderate or above potential for generating contamination which could result in a (source-pathway-receptor) pollutant linkage and therefore potential significant effects. The sites were taken forward to assess the potential pollutant linkage in order to evaluate whether the presence of a source of contamination could potentially lead to harmful consequences.

11.A.2.3.2 A pollutant linkage consists of the following three elements:

- a source of contamination or hazard that has the potential to cause harm or pollution;
- a pathway for the hazard to move along/generate exposure; and
- a receptor which is vulnerable to the potential adverse effects of the hazard.

11.A.2.3.3 Whilst the contamination may be a hazard it would not constitute a risk unless a pathway and receptor are also present and a pollutant linkage can be determined. Therefore, in assessing the potential for contamination to cause a significant effect: the extent and nature of the potential source or sources of contamination must be assessed; any pathways present must be identified; and sensitive receptors or resources identified and appraised to determine their value and sensitivity to contamination related impacts.

- 11.A.2.3.5 Each tier of the Stage 1 risk assessment comprises the following four stages:
- Hazard Identification – involves identifying potential contaminant sources within the study area;
 - Hazard Assessment – assessing the potential for unacceptable risks by identifying what pathways and receptors could be present, and what pollutant linkages could result (forming the Conceptual Site Model);
 - Risk Estimation – predict what degree of harm or pollution might result and how likely); and
 - Risk Evaluation – evaluating whether the risk is acceptable or whether further assessment, remediation or mitigation is required.
- 11.A.2.3.6 To determine the risk to the identified receptor, both the probability (**Table 11.A.2**) and the degree of harm to a potential receptor (consequence – **Table 11.A.3**) are used and the risk estimated for each pollutant linkage using the matrix in **Table 11.A.4**, which is based on standard industry guidance provided within the Construction Industry Research and Information Association (CIRIA) report C552, Contaminated Land Risk Assessment (Ref 11.A.9). The risk classifications are defined in **Table 11.A.5**. Definitions of receptor sensitivity are provided in **Table 11.5** of **Chapter 11, Geology and Hydrogeology** of the Scoping Report.

Table 11.A.2 – Classification of Probability (based on C552^{Error! Bookmark not defined.})

| Classification | Definition |
|-----------------|--|
| High likelihood | There is a pollution linkage and an event either appears very likely in the short-term and almost inevitable over the long-term, or there is already evidence at the receptor of harm/pollution. |
| Likely | There is a pollution linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term. |
| Low likelihood | There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter-term. |
| Unlikely | There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term. |

Table 11.A.3 – Classification of Consequence (based on C552)

| Classification | Examples |
|----------------|---|
| Severe | Human health effect – exposure likely to result in ‘significant harm’ as defined in the Defra (2012) Part 2A Statutory Guidance (Ref 11.A.10). Controlled water effect – short-term risk of pollution (note: Water Resources Act (Ref 11.A.11) contains no scope for considering significance of pollution) of sensitive water resource. Equivalent to Environment Agency Category 1 incident (persistent and/or extensive effects on water quality leading to |

| | |
|--------|---|
| | <p>closure of potable abstraction point or loss of amenity, agriculture or commercial value. Major fish kill.</p> <p>Ecological effect – short-term exposure likely to result in a substantial adverse effect.</p> <p>Catastrophic damage to crops, buildings or property.</p> |
| Medium | <p>Human health effect – exposure could result in ‘significant harm’</p> <p>Controlled water effect – equivalent to Environment Agency Category 2 incident requiring notification of abstractor.</p> <p>Ecological effect – short-term exposure may result in a substantial adverse effect.</p> <p>Damage to crops, buildings or property.</p> |
| Mild | <p>Human health effect – exposure may result in ‘significant harm’.</p> <p>Controlled water effect – equivalent to Environment Agency Category 3 incident (short lived and/or minimal effects on water quality).</p> <p>Ecological effect – unlikely to result in a substantial adverse effect.</p> <p>Minor damage to crops, buildings or property. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).</p> |
| Minor | <p>No measurable effect on humans. Protective equipment is not required during site works.</p> <p>Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.</p> <p>Repairable effects to crops, buildings or property. The loss of plants in a landscaping scheme. Discolouration of concrete.</p> |

Table 11.A.4– Classification of Risk (based on C552)

| | | Consequence | | | |
|-------------|-----------------|-------------|----------|----------|----------|
| | | Severe | Medium | Mild | Minor |
| Probability | High Likelihood | Very High | High | Moderate | Low |
| | Likely | High | Moderate | Moderate | Low |
| | Low Likelihood | Moderate | Moderate | Low | Very low |
| | Unlikely | Low | Low | Very low | Very low |

Note: This risk matrix applies to qualitative risk assessment only.

Table 11.A.5 – Risk Rating Definitions (based on C552)

| Risk Classification | Description |
|----------------------------|---|
| Very high | There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. |
| High | Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. |
| Moderate | It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. |
| Low | It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. |
| Very low | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. |

11.A.3 Preliminary Contamination Assessment

11.A.3.1 Initial Assessment

- 11.A.3.1.1 Much of the Scoping Boundary and study area appears to have remained as undeveloped agricultural land and farm buildings since the earliest reviewed historical mapping from the National Library Scotland, dated 1885 (Ref 11.A.6). In these areas it is considered that there is a very low risk of potential sources of significant existing contamination and therefore they are not taken forward for further assessment.
- 11.A.3.1.2 There are thirty-two sites/areas within the Scoping Boundary, and a further eighteen within the study area, where historical potentially contaminative land uses have occurred or where the current land use is potentially contaminative. Where identified, readily available information relating to these sites and their associated Potential Sources of Contamination (PSC) has been gathered and is presented in **Table 11.A.6** with a corresponding Classification Score for their potential for generating contamination. The locations of these are presented on **Figure 11.4**.

Table 11.A.6 – Potential sources of contamination

| PSC No | Name | Location | Description | Potential for generating contamination |
|------------------------------------|--|---|--|--|
| PSC within Scoping Boundary | | | | |
| 1 | Walk Farm Site B – historical landfill | Little Weighton Cottingham, North Humberside (499800E, 433200N) | The 1888-1913 mapping shows the site as a chalk pit. Identified as a historical landfill that accepted inert and industrial waste (assumed to be non-hazardous at this time) between 1960 and 1985. (ref: EAHLD05028). The earliest reviewed Google aerial imagery, dated 2003, shows no evidence of the landfill/quarry and shows an area of trees. The current land use, based on the most recent Google aerial imagery dated 2022 comprises an area of trees surrounded by open fields. | High |
| 2 | Walk Farm Site C – historical landfill | Little Weighton Cottingham, North Humberside | Identified as a historical landfill that accepted inert and industrial waste between 1960 and 1990 (ref: EAHLD05026). The current land use, based on the most recent Google | High |

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| | | (499700E, 432800N) | aerial imagery dated 2022 comprises open fields. | |
| 3 | Walk Farm Site D – historical landfill | Little Weighton Cottingham, North Humberside (499300E, 433000N) | The 1937-1961 mapping shows a circular pit structure. Identified as a historical landfill that accepted inert and industrial waste between 1960 and 1990 (ref: EAHLD05024). The current land use, based on the most recent Google aerial imagery dated 2022 comprises open fields. | High |
| 4 | Willerby Restoration Limited – landfill site | Albion Lane, Wilerby, Nr Hull, Humberside (498497E, 433377N) | From the earliest reviewed mapping dated 1885-1900 the site is shown as a railways line within a cutting. The earliest reviewed Google aerial imagery, dated 2003, shows the railway line has been removed, by the 2017 Google aerial imagery trees have started to be removed from the cutting sides and by 2019 the cutting appears to have been infilled. The site is identified as a historical landfill, permitted from 2007 to 2018 for inert material. The current land use, based on the most recent Google aerial imagery dated 2022 shows evidence of infilled land. The site is also a current permitted landfill site for inert material. | Moderate |
| 5 | Numerous small chalk pits, that are not classified as a landfill | Various locations across the study area | Present since the earliest mapping reviewed dated 1885. Former chalk pits, typically limited in size. Most are first recorded in the late 1800s/early 1900s and typically not recorded after 1950 and potentially infilled. | Low |
| 6 | Raywell Road – historical landfill | Riplingham, Yorkshire. (496500E, 431700N) | The map dated 1888-1913 indicates the presence of a chalk pit within the location of the historical landfill. The historical landfill received waste from 1948 until 1984 and was licenced to take inert, industrial, commercial and household waste. The earliest Google aerial imagery reviewed dated 2003 shows the site as agricultural fields with no evidence of landfilling. The current land use, based on the most recent Google aerial imagery dated 2022 comprises open fields. | High |
| 7 | Land Adjacent to former A63 | Land Adjacent to former A63 | The map dated 1888-1913 indicates that the northern part of the site is | High |

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| | Ellerker – Borough Road – historical landfill | Ellerker – Borough Road (492900E, 428900N) | labelled as ‘old gravel pits’. The site is indicated to be split into two historical landfills based on the permits available, with one permit for the entire site and one for the northern section of the site. They were both permitted to accept inert, industrial and commercial waste between 1983 and 1994. Information from the permit for the entire site suggests that the historical landfill contains gas control measures. The current land use, based on the most recent Google aerial imagery dated 2022 comprises a mixture of open fields and woodland with no evidence of any landfilling activities. | |
| 8 | Coletta and Tyson – large scale crop growing and nursery | South Cave, Borough, HU15 2FJ (480920E, 429384N) | Currently a large-scale crop grower and nursery. | Low |
| 9 | Ellerker wastewater treatment works | Near Ellerker, East Riding of Yorkshire (490905N, 429204E) | A current small-scale wastewater treatment works. The treatment works is not shown on the reviewed historical mapping; however, it does appear on the earliest Google aerial imagery reviewed dated 2003. | Low |
| 10 | London North Eastern railway line | Runs approximately north-west to south-east through the Scoping Boundary through the village of Broomfleet | Is indicated on the earliest reviewed mapping dated 1888-1913 and is indicated to be present through to the current day based on Google aerial imagery. Appears to be mostly at grade level throughout the Scoping Boundary. | Low |
| 11 | Current and historical brick and tile works, clay pits and tile factory | Bloomfleet, Brough. (486060E, 427334N) | The earliest reviewed mapping dated 1888-1913 indicates a brick and tile works and a clay pit adjacent to the Market Weighton canal. The mapping dated 1937-1961 shows the clay pits have extended to the west and some of the old clay pits are filled with water. Historical aerial photography from Britain from Above dated 1952, shows pits filled with water and a factory with a number of chimneys | Moderate |

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| | | | adjacent to the canal. Google Earth aerial imagery dated 2003 shows the factory seen in the 1952 photography is no longer present and a factory has been built within the centre of the site. Further pits have been excavated to the west of the original pits and some are shown to be filled with water. The 2007 dated Google aerial imagery shows the factory has extended to the north and further excavation has happened to the west. The 2019 Google aerial imagery shows that further excavation has happened to the south-west and are filled with water. | |
| 12 | Gilberdyke and Staddlethorpe wastewater treatment works | Staddlethorpe Broad Lane (484201E, 426326N) | Historical Google aerial imagery dated 2003 shows the wastewater treatment works is in the process of being constructed. By the most recent Google aerial imagery dated 2022 the site has been fully constructed. | Low |
| 13 | Vehicle recovery/garage | Broad Lane, Staddlethorpe, DN14 7XT (484427E, 425561N) | A current vehicle recovery company which appears to be mostly hardstanding. A building in the location of the current building is shown on the oldest reviewed mapping dated 1885-1900. | Low |
| 14 | Luddington sewage treatment works | Carr Lane, Garthorpe and Fockerby, DT17 4AH (416839E, 416839N) | A current sewage treatment works that appears on the most recent Google aerial imagery dated 2022. The sewage treatment works is shown on the 2003 Google aerial imagery and indicates some treatment tanks and two overgrown filter beds to the east. | Low |
| 15 | Knapton's Landfill | Luddington, Haldenby Ness (482500E, 416000N) | Historical landfill that was licenced to take inert waste between 1978 and 1990 (ref: EAHLD05054). The current land use, based on the most recent Google aerial imagery dated 2022 comprises open fields with no evidence of landfilling. | Moderate |
| 16 | Railway Line | Great Northern and Eastern Joint railway. Runs approximately north-west to | The railway is shown on the earliest reviewed mapping dated 1885-1900 and continues to be present through to the current day. Appears to be | Low |

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| | | south-east through the Scoping Boundary | mostly at grade level throughout the Scoping Boundary. | |
| 17 | Refuse tip off Caves Lane | Caves Lane, Walkeringham, Doncaster, South Yorkshire. (475500E, 392400N) | First shown on the 1937-1961 historical mapping marked as a clay pit. Historical landfill, licenced to accept inert, industrial, commercial, household and special waste between 1966 and 1982. (ref: EAHLD22050). Google aerial imagery dated 2003 shows the landfill has been restored and is being used as a nature reserve up to the current Google aerial imagery dated 2022. | High |
| 18 | High Marnham Power Station historical landfill | (479700E, 371100N) | Historical mapping shows that the landfill is located adjacent to a railway line which has now been dismantled. A historical landfill that was licenced to take inert and industrial waste between 1978 and 1994 however the last input was in 1979. The current land use, based on the most recent Google aerial imagery dated 2022 comprises an open area of scrub land. | High |
| 19 | Dismantled railway line | Running approximately east to west through the Scoping Boundary | The railway first appeared on the historical map dated 1885-1900, the railway was later used to transport coal to the power station. The railway line was later used by Network Rail as a test track. Google Aerial Imagery shows that the railway line was dismantled by 2004. The current land use, based on the most recent Google aerial imagery dated 2022 comprises disused scrub land. | Low |
| 20 | Former High Marnham Power Station and current substation. | Sparrow Lane, Marnham, High Marnham, Bassetlaw (480950E, 371103N) | An internet search has indicated that the coal fuelled power station was first constructed in 1959 and became fully operational in 1962. The plant operated until 2003 when it was decommissioned, though the cooling towers weren't demolished until 2012. Historical Google Aerial Imagery shows that the north of the site was utilised to stockpile waste material from the power station. | High |

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| | | | The south-west part of the site is currently in use as an electricity substation while the rest of the site comprises open unused land. | |
| 21 | High Marnham Power Station landfill | High Marnham (481000E, 371100N) | The landfill forms part of the storage area of the old power station. The landfill was authorised to accept industrial waste and waste was input from 1978 until 1979. Based on the most recent Google aerial imagery dated 2022 the site is disused open land. | High |
| 22 | Multiple chalk/clay/brick pits that haven't been identified as a landfill | Various locations | Historically comprised a number of pits throughout the study area which were quarried for chalk/clay etc. These pits have not been identified as landfill, with some of them now filled with water. | Low |
| 36 | Railway line, Trent Ancholm and Grimsby Line | 479932E, 411074N | The railway line is shown on the reviewed mapping dated 1885-1900 and is present through to the present day. | Low |
| 39 | Railway line – Great Central Railway – Lincoln and Redford Branch | Two lines that enter the Scoping Boundary from the west, and split into two lines heading north-east and south-east | The railway line is present on the earliest reviewed mapping dated 1885-1900 and indicates that the line is sometimes on an embankment and sometimes at grade. The railway line is still indicated to be present based on the most recent Google aerial imagery dated 2022. | Low |
| 41 | Wastewater treatment works | Main Street, Rampton, Retford DN22 0LA (477015E, 377330N) | The treatment works is first shown on the historical mapping dated 1919-1930. The Google aerial imagery dated 2000 shows a number of treatment beds as well as some overgrown treatment bed. | Low |
| 42 | Sewage sludge disposal site | East of Rowley Road, Ripplingham, Little Weighton (498150E, 432598N) | Identified from the East Riding of Yorkshire Council dataset. Based on the historical mapping reviewed, dated from between 1885-1965, and the Google aerial imagery dated from 2003 until the present day the site appears to have been in agricultural use in that time period. | Low |

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| 43 | Blacksmith's row – general works | Blacksmith's row, Ellerker, HU15 2DH (492146E, 429371N) | Identified from the East Riding of Yorkshire Council dataset and currently comprises a row of cottages. Historical mapping dated 1885-1900 shows the village of Ellerker and a smithy is labelled at the location however by the mapping dated 1945-1965 this is no longer labelled. | Low |
| 44 | Depot | Main Street, Ellerker HU15 2DU (492135E, 429340N) | Identified from the East Riding of Yorkshire Council dataset. The mapping dated 1885-1900 indicates a building located on the site. Google aerial imagery dated 2003 shows the site to have industrial style buildings to the north and a number of lorry/HGV vehicles parked, and the site appears to predominantly comprise hardstanding. The site remains largely unchanged to the present day with evidence of its continued use as a depot. | Low |
| 45 | Sewage sludge disposal site | North of Ings Lane, South Cave HU15 2FJ (490288E, 428908N) | Identified from the East Riding of Yorkshire Council dataset. Based on the historical mapping reviewed, dated from between 1885-1965, and the Google aerial imagery dated from 2003 until the present day the site appears to have been in agricultural use in that time period. | Low |
| 46 | Sewage sludge disposal site | Blacktoft House Drive, Blacktoft DN14 7XT (483291E, 425575N) | Identified from the East Riding of Yorkshire Council dataset. Based on the historical mapping reviewed, dated from between 1885-1965, and the Google aerial imagery dated from 2003 until the present day the site appears to have been in agricultural use in that time period. | Low |
| 47 | Railway line – Fockerby Branch | Crosses the Scoping Boundary in a north-east south-west direction. | Identified on the North Lincolnshire potentially contaminated land dataset. The historical mapping dated 1888-1913 shows the railway line crossing the study area in a north-east south-west direction and indicates the line is likely at grade. An internet search indicates that the railway line was opened in August 1903 and closed in July 1933. Google aerial imagery dated 2003 indicates the line is no longer present and the area of the | Low |

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| | | | railway predominantly comprises trees and agricultural land which remain until the most recent aerial imagery reviewed. | |
| 48 | North Wheatley sewage treatment works | South of Top Pasture Lane, North and South Wheatley (476838E, 385842N) | The sewage treatment works has been identified by North Lincolnshire Council and corresponds with processing tanks identified on the 2003 Google aerial imagery. | Low |
| PSC within Study Area (250 m) | | | | |
| 23 | Creyke Beck Substation | Cottingham, HU16 5SB (504487E, 435000N) | The substation doesn't appear on the reviewed mapping, provided by the National Library of Scotland, however pylons are first shown on the mapping dated 1937-1961. The earliest reviewed Google aerial imagery dated 2003 shows the substation to be present, by the imagery dated 2015 the north-east part of the site is no longer showing substation infrastructure. The substation continues to be present on the most recent Google aerial imagery dated 2022. | Moderate |
| 24 | Cottingham Caravan and Motorhome Services/repair shop | Park Lane Cottingham HU16 5SB | The site does not appear on the reviewed mapping, provided by the National Library of Scotland, and first indication of the site is shown on the 2003 dated Google aerial imagery and continues to be present on the most recent Google aerial imagery dated 2022. | Low |
| 25 | Creyke Beck Substation | Park Lane, Cottingham (5024260E, 434638N) | The substation is first identified on the 2017 Google aerial imagery and continues to be present on the most recent Google aerial imagery dated 2022. | Low |
| 26 | Dogger Bank Wind Farm | A1079, Cottingham, HU17 0RN (504010E, 436107N) | Dogger Bank Wind Farm converter station appears to start construction in 2019, based on the Google aerial imagery, and appears to be currently still in construction based on the 2022 Google aerial imagery. | Low |
| 27 | Risby Wood Landfill | (501300E, 435200N) | The site details indicate it was exempt from a licence. The site first appears | Low |

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| | | | on the 1888-1913 map as a pond, and more recently the Google Aerial Imagery (2003) shows the site is agricultural land and continues to be based on the 2022 Google aerial imagery . | |
| 28 | Scrapyard | Little Wellington Road, Skidby, HU16 5TP (500748E, 433746N) | The site does not appear on the reviewed historical mapping. However, it is shown on the Google aerial imagery dated 2003. By the aerial imagery dated 2007 the site appears to have expanded to the south. The site appears to still be present based on the most recent Google aerial imagery dated 2022. | Low |
| 29 | Industrial estate - storage yard/garage/body shop | Hunsdale Farm Industrial Estate, HU15 2DB (492722E, 429983N) | Industrial estate that appears to include vehicle storage, garage and body shop. A small building is shown on the map dated 1888-1913 in the north-east corner of the site. By the map dated 1937-1961 numerous buildings are now shown in the north-east corner. Historical Google aerial imagery dated 2003 shows the site in generally the same configuration as the modern day, however the section to the south-west appears to be in the process of being constructed. By the 2007 dated imagery the area to the south-west is being used as vehicle storage. | Low |
| 30 | Vehicle storage/caravan dealership | Brough Road, South Cave, Borough, HU15 2DB (492613E, 430070N) | The site is indicated as being used as a vehicle storage area and caravan dealership based on the Google aerial imagery and Google mapping information. The site does not appear on the reviewed historical mapping. However, is shown on the Google aerial imagery dated 2003. The site has remained largely unchanged since then based on the 2022 Google aerial imagery. | Low |
| 31 | Fuel station | Borough Road, South Cave HU15 2DA (492792E, 430211N) | The site is indicated as being used as a fuel station based on the Google aerial imagery and Google mapping information, the site does not appear on the reviewed historical mapping. However, is shown on the Google aerial imagery dated 2003 and | Low |

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| | | | remains largely unchanged based on the 2022 Google aerial imagery. | |
| 32 | Ellerker Pits landfill No.2 | (493100E, 428500N) | The site is indicated to be a historical landfill that received inert waste from 1990 until 1994. The site is indicated on the earliest reviewed historical mapping dated 1888-1913 as a series of gravel pits. By the Google aerial imagery dated 2003 the site is shown as agricultural land and has been entirely restored. | Moderate |
| 33 | Small scale industrial unit | Newstead Farm, Brough, HU15 2UY (484927E, 427912N) | The site is shown on the earliest reviewed historical mapping dated 1885-1900 as a single building. By the Google aerial imagery dated 2003 the site appears to be a number of agricultural buildings. By the imagery dated 2007 the site is being redeveloped and the external areas used as storage. By the imagery dated 2012 the site has been redeveloped and is arranged the same as the modern day. | Low |
| 34 | Keadby Power Station landfill | 481700E, 412000N | The site is identified as a historical landfill site which was used by the Keadby Power Station (outside of study area). Waste was first input in 1958, however a last input, or license surrender date is not available. The landfill was licenced to take inert and industrial waste. The Google aerial imagery dated 2003 indicates the site has been restored and comprises open fields and scrub/woodland. Based on the 2019 Google aerial imagery the central section of the landfill (outside of the study area) shows potential development. | High |
| 35 | Former Keadby Power Station landfill | Station Road, Keadby, Scunthorpe, South Humberside (481300E, 411500N) | The site, which is located to the south of PSC 34, was a licenced landfill which accepted industrial, commercial, household and special waste. The licence was issued in 1987 however a surrender date or first and last input is not shown. The Google aerial imagery dated 2002 shows the site as being mostly restored with just the access roads being present. By the Google aerial | High |

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| | | | imagery dated 2019 the site has been partially vegetated (grass) and the access roads obscured. | |
| 37 | Small industrial estate and historically Walkeringham brick works | The Old Brickyard, Brickyard Lane, Doncaster DN10 4LZ (475371E, 392691N) | On the mapping dated 1885-1900 the site is labelled as a brick yard with a number of buildings present. By the map dated 1888-1913 the site is labelled as Walkeringham brick works and the site shows evidence of being worked. Mapping dated 1937-1961 indicates that some of the pits have been infilled with water. The Google aerial imagery dated 2003 indicates the site comprises a small industrial estate to the east and buildings to the west with a pit infilled with water. By the aerial imagery dated 2015 the northern half of the industrial estate has been expanded. On the 2020 imagery the area to the east of the industrial estate shows some evidence of development, and by the 2021 aerial imagery two basins have been added and are shown to be infilled with water. Anecdotal evidence from an internet search suggests that once brick making ceased at the site it was used for creating silver cleaning powder with the eastern bank being used as a timber and saw mill. | Moderate |
| 38 | Farm / polytunnels | Harwill Farm, Wood Lane, Retford, DN22 9FA (476136E, 387849N) | A current farm with a number of polytunnels/greenhouses. | Low |
| 40 | The Mike Harris Learning and Development Hospital | Rampton, Woodbeck Retford DN22 0JR (477559E, 377655N) | The site is first shown on the 1892-1914 historical mapping and labelled as "Rampton Criminal Lunatic Asylum". By the mapping dated 1937-1961 the site has expanded and is now labelled Rampton Hospital (Ministry of Health). The Google aerial imagery dated 2000 shows the site is in the process of being expanded further. By the 2008 imagery, further modifications are being undertaken on the site. | Low |

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| 49 | General works | Westoby Lane, Riplingham (496270E, 431959N) | The historical mapping dated 1888-1913 shows a smithy present on the site. By the mapping dated 1937-1961 this site is no longer marked as a smithy. The Google aerial imagery dated 2003 indicates the smithy has been redeveloped for housing and there is an industrial building located to the north with associated hardstanding parking area. | Low |
| 50 | Fountain Hill Brickworks | Fountain Hill, Walkeringham, Bassetlaw (475426E, 393545N) | Fountain Hill brick works is shown on the 1888-1913 historical mapping with evidence of workings to the east of the buildings. By the mapping dated 1919-1930 the buildings and worked area are no longer shown. The 2003 Google aerial imagery indicates water features in the location of the former workings (assumed to be water filled excavations/pits). | Low |

- 11.A.3.1.3 The initial assessment has identified thirty-three sites with a low or very low potential for generating contamination and these have been scoped out of further assessment on the basis that significant effects in relation to contamination are unlikely.
- 11.A.3.1.4 Seventeen sites have been identified with a moderate or above potential for generating contamination and these have been taken forward for further assessment in section 11.A.3.2.

11.A.3.2 Further Assessment

| Site name/ref | PSC 1 – Walk Farm Site B – historical landfill |
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| Site location and description | <p>Little Weighton Cottingham, North Humberside (499800E, 433200N).</p> <p>The site is located to the north of Riplingham Road within an area of trees within an open field and directly south-east of Walk Farm. Approximately 1.3 km south-east of Little Weighton. The site is surrounded by further open fields.</p> |
| Site history | The 1888-1913 mapping shows the site as a chalk pit. The earliest Google aerial imagery reviewed, dated 2003, shows no evidence of the landfill/quarry and shows an area of trees. |
| Other pertinent information | Identified by the Environment Agency data as a historical landfill that accepted inert and industrial waste with the first input of waste in 1960 and the last input in 1985. The site was licenced from 1977 until 1985 (ref: EAHLD05028). |
| Geology | The BGS Geoindex indicates that the superficial deposits are absent, with the bedrock indicated to comprise the Burnham Chalk Formation. |
| Hydrogeology | The Burnham Chalk Formation which forms the bedrock at the site, is classified as a Principal Aquifer. The site is also located within a SPZ 2, and a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | The site is located within a Nitrate Vulnerable Zone. |
| Potential for generating contamination | High – as the site accepted both inert and industrial waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|---|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Low. The site is relatively small and within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). In addition, confined spaces are not anticipated within which any ground gases could potentially accumulate | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any expected and unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Medium | Low. The landfill is small scale and therefore may not interact with the future Order Limits, particularly in consideration that OHL is proposed in this area and therefore excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). | Moderate |

| Site name/ref | PSC 2 – Walk Farm Site C – historical landfill |
|--|--|
| Site location and description | Little Weighton Cottingham, North Humberside (499700E, 432800N). The site is located to the north of Riplingham Road within an area of open field and directly south of Walk Farm. Approximately 1.4 km south-east of Little Weighton. The site is surrounded by further open fields. |
| Site history | The historical mapping reviewed shows no evidence of the landfill or any quarrying activities. The earliest Google aerial imagery reviewed, dated 2003, shows no evidence of the landfill/quarry and shows an area of open fields. |
| Other pertinent information | Identified by the Environment Agency data as a historical landfill that accepted inert and industrial waste between 1960 and 1990. The site was licenced from 1980 until 1990 (ref: EAHLD05026). |
| Geology | The BGS Geoindex indicates that the superficial deposits are absent, with the bedrock indicated to comprise the Burnham Chalk Formation. |
| Hydrogeology | The Burnham Chalk Formation which forms the bedrock at the site, is classified as a Principal Aquifer. The site is also located within a SPZ 2, and a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | The site is located within a Nitrate Vulnerable Zone. |
| Potential for generating contamination | High – as the site accepted both inert and industrial waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers. Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|---|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Low. The site is relatively small and within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). In addition, confined spaces are not anticipated within which any ground gases could potentially accumulate. | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any expected and unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Medium | Low. The landfill is small scale and therefore may not interact with the future Order Limits, particularly in consideration that OHL is proposed and therefore excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance) | Moderate |

| Site name/ref | PSC 3 – Walk Farm Site D – historical landfill |
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| Site location and description | Little Weighton Cottingham, North Humberside (499300E, 433000N). The site is located to the north of Riplingham Road within an area of open field and directly south of Walk Farm. Approximately 1.0 km south-east of Little Weighton. The site is surrounded by further open fields. |
| Site history | The 1937-1961 mapping shows a circular feature. The earliest Google aerial imagery reviewed, dated 2003, shows no evidence of the landfill/quarry and shows an area of trees. |
| Other pertinent information | Identified by the Environment Agency data as a historical landfill that accepted inert and industrial waste between 1960 and 1990. The site was licenced from 1980 until 1990 (ref: EAHLD05026). |
| Geology | The BGS Geoindex indicates that the superficial deposits are absent, with the bedrock indicated to comprise the Burnham Chalk Formation. |
| Hydrogeology | The Burnham Chalk Formation which forms the bedrock at the site, is classified as a Principal Aquifer. The site is also located within a SPZ 2, and a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | The site is located within a Nitrate Vulnerable Zone. |
| Potential for generating contamination | High – as the site accepted both inert and industrial waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|---|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Low. The site is relatively small and within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). In addition, confined spaces are not anticipated within which any ground gases could potentially accumulate. | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any expected and unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Medium | Low. The landfill is small scale and therefore may not interact with the future Order Limits, particularly in consideration that OHL is proposed and therefore excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). | Moderate |

| Site name/ref | PSC 4 – Willerby Restoration Limited – landfill site |
|--|---|
| Site location and description | Albion Lane, Wilerby, Nr Hull, Humberside (498497E, 433377N) The site is a long thin part of a former railway line running in an approximately north-west/south-east direction located to the south of Little Weighton. |
| Site history | From the mapping dated 1885-1900 the site is shown as a railway line within a cutting. The earliest Google aerial imagery reviewed, dated 2003, indicates that the railway line has been removed but the cutting is still apparent. The 2017 Google aerial imagery appears to show that trees have started to be removed from the cutting sides and by 2019 the cutting appears to have been infilled. The 2022 imagery indicates the area is fully grassed over. |
| Other pertinent information | The site is identified by the Environment Agency data as a historical landfill permitted (ref:EAHLD36045) from 2007 to 2018 for inert material, with the first input being in 2014, and no last input date provided – which may be because the site is also a current permitted landfill site ⁴ licenced to accept inert material. The current licence was first issued in 2016 (ref: SIM147). |
| Geology | The BGS Geoindex indicates that the superficial deposits are absent along much of the site, however Head Deposits are noted crossing the site to the south of the Scoping Boundary along Riplingham Road, with the bedrock indicated to comprise the Burnham Chalk Formation. |
| Hydrogeology | The Burnham Chalk Formation which forms the bedrock at the site, is classified as a Principal Aquifer, the Head Deposits are indicated to be a Secondary Undifferentiated Aquifer. The site is also located within a SPZ 2, and a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | The site is located within a Nitrate Vulnerable Zone. |
| Potential for generating contamination | Moderate – as only licenced to accept inert waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|-------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Mild | Unlikely. The landfill is not anticipated to contain significantly contaminative materials or generate significant landfill gas based on it only accepting inert waste. In addition, there is not expected to be any confined spaces for any ground gases to accumulate. | Very low |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Mild | Low. The landfill is not anticipated to contain significantly contaminative materials as it was only licenced to accept inert waste. | Low |

| Site name/ref | PSC 6 – Raywell Road – historical landfill |
|--|--|
| Site location and description | Raywell Road, Ripplingham, Yorkshire. (496500E, 431700N). The site is located directly south of South Cave Road, near the junction with Rowley Road. The site is approximately 3 km south-west of Little Weighton. |
| Site history | The map dated 1888-1913 indicates the presence of a chalk pit within the location of the subsequent historical landfill which has been identified by the Environment Agency data. The Google aerial imagery dated 2003 shows the site as agricultural use with no evidence of landfilling. |
| Other pertinent information | Based on the information obtained from the Environment Agency data the historical landfill received waste from 1948 until 1984 with the licence being issued in 1978. No surrender date is supplied (ref:EAHLD05020). The site was licenced to take inert, industrial, commercial and household waste. |
| Geology | The BGS Geoindex indicates that the superficial deposits are indicated to be absent at the site, with the bedrock indicated to comprise the Burnham Chalk Formation. |
| Hydrogeology | The Burnham Chalk Formation which forms the bedrock at the site, is classified as a Principal Aquifer. The site is also located within a SPZ 3, and a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | The site is located within a Nitrate Vulnerable Zone. |
| Potential for generating contamination | High - as the site accepted both inert and industrial waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|---|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Low. The landfill accepted a variety of wastes; however, the site is relatively small and within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). In addition, confined spaces are not anticipated within which any ground gases could potentially accumulate. | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any expected and unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Medium | Low. The landfill is small scale and therefore may not interact with the future Order Limits, particularly in consideration that OHL is proposed and therefore excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). | Moderate |

| Site name/ref | PSC 7 – land adjacent to former A63 Ellerker – historical landfill |
|--|---|
| Site location and description | Land Adjacent to former A63 Ellerker – Borough Road (492900E, 428900N). The site is located directly to the west of Cave Road, approximately 750 m south-east of Ellerker. The site is currently open fields and areas of woodland surrounded by other open fields. |
| Site history | The map dated 1888-1913 indicates that the northern part of the site is labelled as ‘old gravel pits’. The Google Aerial Imagery dated 2003 indicates the site has already been restored. |
| Other pertinent information | The site is indicated to comprise two historical landfills with two associated licences, based on the information obtained from the Environment Agency data. One licence covers the entire site (ref:EAHLD05031) was issued in 1983 and surrendered in 1994. The site received inert, industrial and commercial waste. Information from the Environment Agency data suggests that the historical landfill contains gas control measures. The other licence covered the northern part of the site (which is also covered by the previous licence) however no licence issue dates, or waste input dates are given. The licence is for inert and industrial waste (ref: EAHLD05030). |
| Geology | The BGS Geoindex indicates that the superficial deposits are indicated to be absent from the majority of the site, however the Bielby Sand Member is indicated to be present in the southern part. The bedrock is indicated to comprise the Upper Lincolnshire Limestone Member. |
| Hydrogeology | The Upper Lincolnshire Limestone Member which forms the bedrock at the site, is classified as a Principal Aquifer. The Bielby Sand Member is classified as a Secondary A Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | High - as the site accepted both inert and industrial waste |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|---|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Low. The site is within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). In addition, confined spaces are not anticipated within which any ground gases could potentially accumulate. | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any expected and unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Medium | Likely Low. The landfill may not interact with the future Order Limits, particularly in consideration that OHL is proposed and therefore excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance) | Moderate |

| Site name/ref | PSC 11 – Current and historical brick and tile works, clay pits and tile factory |
|--|--|
| Site location and description | Tongue Lane, Bloomfleet, Brough (486060E, 427334N). The site is located directly to the west of Landing Lane. The site is currently a tile factory surrounded by old pits that appear to have been allowed to fill with water. |
| Site history | The mapping dated 1888-1913 indicates a brick and tile works and a clay pit adjacent to the Market Weighton canal. The mapping dated 1937-1961 shows the clay pits have extended to the west and some of the old clay pits are filled with water. Historical aerial photography from Britain from Above dated 1952, shows pits filled with water and a factory with a number of chimneys adjacent to the canal. Google aerial imagery dated 2003 shows the factory seen in the 1952 photography is no longer present and a factory has been built within the centre of the site. Further pits have been excavated to the west of the original pits and some are shown to be filled with water. The 2007 dated aerial imagery shows the factory has extended to the north and further excavation has happened to the west. The 2019 aerial imagery shows that further excavation has happened to the south-west and subsequently filled with water. |
| Geology | The BGS Geoindex indicates that the superficial deposits are indicated to comprise the Warp and the Hemingbrough Glaciolacustrine Formation. The bedrock is indicated to comprise the Mercia Mudstone Group. |
| Hydrogeology | The Mercia Mudstone Group which forms the bedrock at the site, is classified as a Secondary B Aquifer. The Warp is classified as a Secondary A Aquifer while the Hemingbrough Glaciolacustrine Formation is classified as Unproductive Strata. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | Moderate |
| Potential contaminants | Heavy metals, asbestos, hydrocarbons, ash/clinker |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|-------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Mild | Unlikely. The former clay pits do not appear to have been infilled. In addition, the site is still active (tile factory) and therefore significant excavations at the site are not anticipated. | Very low |
| | Leaching Migration Deposition | Groundwater (medium/low sensitivity) | Mild/Minor | Unlikely. The former clay pits do not appear to have been infilled. In addition, the site is still active (tile factory) and therefore significant excavations at the site are not anticipated. | Very low |

| Site name/ref | PSC 15 – Knapton’s Landfill |
|--|---|
| Site location and description | Luddington, Haldenby Ness (482500E, 416000N). The site is located directly north-west of Eastoft Road approximately 400 m south-west of Luddington. The site comprises open fields |
| Site history | The site is shown on the map dated 1885-1900 as open fields in an area labelled as Haldenby Ness, the Old River Don river is labelled and bounds the southern and eastern part of the site. The Google aerial imagery dated 2003 shows the site as open fields. |
| Other pertinent information | The site is indicated to be a landfill and was licenced to receive inert waste between 1978 and 1990 and had the same input dates (ref: EAHLD05054) based on the information from the Environment Agency data. |
| Geology | The BGS Geoindex indicates that the superficial deposits are indicated to comprise Alluvium which overlies bedrock of the Mercia Mudstone Group. |
| Hydrogeology | The Mercia Mudstone Group which forms the bedrock at the site, is classified as a Secondary B Aquifer. The Alluvium is classified as a Secondary A Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | Moderate - as only licenced to accept Inert waste |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|-------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Mild | Unlikely. The landfill is not anticipated to contain significantly contaminative materials or generate significant landfill gas as it was licenced to receive inert material only. In addition, there is not expected to be any confined spaces for any ground gases to accumulate. | Very low |
| | Leaching Migration Deposition | Groundwater (medium sensitivity) | Mild | Unlikely. The landfill is not anticipated to contain significantly contaminative materials as it was only licenced to accept inert waste. | Very low |

| Site name/ref | PSC 17 – refuse tip off Caves Lane |
|--|--|
| Site location and description | Caves Lane, Walkeringham, Doncaster, South Yorkshire (475500E, 392400N). The site is located directly south of Caves Lane and east of Fountain Hill. The site is located approximately 1.5 km west of Walkeringham. The site is located on partially wooded ground partially open scrub land. |
| Site history | The site is first shown on the 1937-1961 historical mapping marked as a clay pit. Google Earth Aerial Photography dated 2003 shows the landfill has been restored and is being used as a nature reserve. |
| Other pertinent information | The site is noted as a historical landfill, based on the Environment Agency data which was licenced to accept inert, industrial, commercial, household and special waste between 1977 and 1982 (ref:EAHLD22050) however waste was first input into the landfill in 1966. |
| Geology | The BGS Geoindex indicates that the superficial deposits are indicated to be present on the southernmost part of the site comprising Head Deposits which overlies bedrock of the Mercia Mudstone Group. |
| Hydrogeology | The Mercia Mudstone Group which forms the bedrock at the site, is classified as a Secondary B Aquifer. The Head Deposits are classified as a Secondary Undifferentiated Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | High |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|---|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Likely. The landfill may have received waste that could be contaminative; however, the landfill boundary provided by the Environment Agency boundary does not seem to match the site which may actually locate outside of the Scoping Boundary. In addition, the site is at the edge of the Scoping Boundary and therefore may not be part of the later Order Limits. The site is also within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). In addition, confined spaces are not anticipated within which any ground gases could potentially accumulate. | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any expected and unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (low sensitivity) | Mild | Likely. The landfill may have received waste that could be contaminative; however, the landfill boundary provided by the Environment Agency boundary does not seem to match the site which may actually locate outside of the Scoping Boundary. In addition, the site is at the edge of the Scoping | Moderate |

Boundary and therefore may not be part of the later Order Limits. The site is also within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance).

| Site name/ref | PSC 18 – High Marnham Power Station historical landfill |
|--|---|
| Site location and description | High Marnham Power Station historical landfill (479700E, 371100N), near Newark. The site is located adjacent to the dismantled railway line, approximately 1.2 km north-west of High Marnham. The site is currently identified as scrub land. |
| Site history | Historical mapping dated 1885-1900 shows the site to the north of a railway line and Fledborough Station. The Google aerial imagery dated 2000 shows the railway still in place. However, the station has been removed and the site appears to be open land. By the 2004 aerial imagery the railway line has started to be dismantled and by 2008 is has mostly all been removed. |
| Other pertinent information | Based on the information from the Environment Agency data the historical landfill was licenced to take inert and industrial waste between 1978 and 1994, however the last input was noted to be in 1979. |
| Geology | The BGS Geoindex indicates that the superficial deposits are found to be absent across the site, with the bedrock comprising the Mercia Mudstone Group. |
| Hydrogeology | The Mercia Mudstone Group which forms the bedrock at the site, is classified as a Secondary B Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | High – as the site accepted both inert and industrial waste. |
| Potential contaminants | Heavy metals, ash, clinker, pulverised fuel ash (PFA), sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|--|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Likely. The landfill may have received waste that could be contaminative. However, the site is also within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (low sensitivity) | Mild | Likely. The landfill may have received waste that could be contaminative. However, the site is also within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). | Moderate |

| Site name/ref | PSC 20 – Former High Marnham Power Station and current substation |
|--|--|
| Site location and description | Sparrow Lane, Marnham, High Marnham, Bassetlaw (480950E, 371103N). The site has mostly been demolished with areas of empty land present. The bases of the cooling towers appear to still be in place. The south-west part of the site is in use as the current National Grid substation. |
| Site history | A general internet search has indicated that the coal fuelled power station was first constructed in 1959 and become fully operational in 1962. The plant operated until 2003 when it was decommissioned, though the cooling towers weren't demolished until 2012. Historical Google aerial imagery shows that the north of the site was utilised to stockpile waste material from the power station. The south-west part of the site is currently in use as an electricity substation. |
| Geology | The BGS Geindex indicates that the superficial deposits are found to be absent across the southern part of the site with the Holme Pierrepont sand and gravel present to the north, the bedrock is indicated to comprise the Mercia Mudstone Group. |
| Hydrogeology | The Mercia Mudstone Group which forms the bedrock at the site, is classified as a Secondary B Aquifer with the superficial Holme Pierrepont gravels classified as a Secondary A Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | High |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, PFA, hydrocarbons, polychlorinated biphenyls (PCBs). |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|--|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Likely. The site is extensive, and contaminated ground may be present within this area. | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (Medium sensitivity) | Medium | Likely. The site is extensive and contaminated ground may be present in this area | Moderate |

| Site name/ref | PSC 21 – High Marnham Power Station landfill |
|--|---|
| Site location and description | High Marnham (481000E, 371100N). The site forms part of the old High Marnham Power Station, discussed in PSC 20. The landfill is located along the eastern boundary of the site within the area which was used to stockpile materials. |
| Site history | The landfill forms part of the storage area of the old power station. The history of the power station is discussed in PSC 21. |
| Other pertinent information | The site was licenced to receive industrial waste from 1978 until 1994, however the last input is noted to be in 1979 (ref: EAHL22091). |
| Geology | The BGS Geoindex indicates that the superficial deposits comprise the Holme Pierrepont sand and gravel and the bedrock is indicated to comprise the Mercia Mudstone Group. |
| Hydrogeology | The Mercia Mudstone Group which forms the bedrock at the site, is classified as a Secondary B Aquifer with the superficial Holme Pierrepont gravels classified as a Secondary A Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | High – as the site accepted both inert and industrial waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, PFA, hydrocarbons, polychlorinated biphenyls (PCBs). |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|--|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Likely. The landfill may have received waste that could be contaminative. However, the site is also within an area where overhead line (OHL) is proposed. Therefore, excavations are likely to be localised and may not interact with the site (therefore there would be no ground disturbance). | Moderate. However, assuming that construction and maintenance workers wear appropriate PPE and follow appropriate protocols (for confined space entry and dealing with any unexpected contamination) the risk can be reduced to Low. |
| | Leaching Migration Deposition | Groundwater (Medium sensitivity) | Medium | | |

| Site name/ref | PSC 23 – Creyke Beck Substation |
|--|--|
| Site location and description | Cottingham, HU16 5SB (504487E, 435000N). The site is located adjacent to the Scoping Boundary off Dunswell Road in the most northern section. The site comprises a substation, which is mostly comprised of hardstanding and various electricity infrastructure. |
| Site history | The substation doesn't appear on the reviewed mapping, provided by the National Library of Scotland, however pylons are first shown on the mapping dated 1937-1961. The historical Google aerial imagery dated 2003 shows the substation to be present, by the imagery dated 2015 the north-east part of the site is no longer showing substation infrastructure and appears to be vacant hardstanding till the present day. |
| Geology | The BGS Geindex indicates that the superficial deposits comprise sand and gravel of uncertain age and origin and the bedrock is indicated to comprise the Burnham Chalk Formation. |
| Hydrogeology | The Burnham Chalk Formation which forms the bedrock at the site, is classified as a Principal Aquifer and the sands and gravels are designated as a Secondary A Aquifer. The site is also located within a SPZ 1, and a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | Nitrate vulnerable Zone |
| Potential for generating contamination | Moderate |
| Potential contaminants | Heavy metals, hydrocarbons, PCBs. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|-------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Mild | Unlikely. The site is outside of the Scoping Boundary and therefore unlikely to be disturbed by construction activities. | Very low. |
| | Leaching Migration Deposition | Groundwater (Very high sensitivity) | Medium | Unlikely. The site is outside of the Scoping Boundary and therefore unlikely to be disturbed by construction activities. | Low |

| Site name/ref | PSC 32 – Ellerker Pits Landfill No.2 – historical landfill |
|--|--|
| Site location and description | Land adjacent to former A63 Ellerker – Borough Road (493100E, 428500N) The site is located directly to the west of Cave Road, approximately 750 m south-east of Ellerker. The site is currently open fields and areas of woodland surrounded by other open fields. |
| Site history | The site is indicated on the earliest reviewed historical mapping dated 1888-1913 as a series of gravel pits. By the earliest Google aerial imagery reviewed dated 2003 the site is shown as agricultural land and has been entirely restored. |
| Other pertinent information | The site was licenced from 1990 to 1994, for inert waste (ref: EAHLD05032) based on the Environment Agency data. |
| Geology | The BGS Geoindex indicates that the superficial deposits are indicated to be absent within the majority of the site, however the southern portion is overlain by the Bielby Sand Member. The bedrock indicated to comprise the Upper Lincolnshire Limestone Member. |
| Hydrogeology | The Upper Lincolnshire Limestone Member which forms the bedrock at the site, is classified as a Principal Aquifer. The Bielby Sand Member is classified as a Secondary A Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | Moderate – as the site only received inert waste. |
| Potential contaminants | Heavy metals, ash, clinker, sulphates, hydrocarbons, ground gas. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|---|-------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Mild | Unlikely. The landfill accepted inert waste therefore widespread contamination or ground gas is considered unlikely. The site is also unlikely to be disturbed by construction activities as it is outside of the Scoping Boundary. | Very low |
| | Leaching Migration Deposition | Groundwater (high sensitivity) | Mild | Unlikely. The landfill accepted inert waste therefore widespread contamination is considered unlikely. The site is also unlikely to be disturbed by construction activities as it is outside of the Scoping Boundary. | Very low |

| Site name/ref | PSC 34 and 35 – Keadby Power Station Landfill and former Keadby Power Station landfill |
|--|--|
| Site location and description | Station Road, Keadby, Scunthorpe, South Humberside (481700E, 412000N and 481300E, 411500N). The sites are accessed from Chapel Lane and is west of the former Keadby Power Station. The area comprises mostly open scrub land with a substation on the eastern side of the site. To the east of the sites are two gas-fired power stations which were built on the older coal power station. |
| Site history | From a general internet search Keadby Power Station was first authorised in 1947 and the coal station was later closed in 1984 and later redeveloped to form gas fired power stations. The landfill sites are located to the west of the power stations. The Google aerial imagery dated 2003 shows the site has been restored. |
| Other pertinent information | Waste was first input in 1958; however, a last input or license surrender date is not available for the northern landfill (EAHLD31480). The landfill was licenced to take inert and industrial waste The southern landfill site was a licenced landfill which accepted industrial, commercial, household and special waste. The licenced was issued in 1987 however a surrender date or first and last input is not shown (EAHLD30519). It is expected that these landfills received waste from the old coal fired power stations. |
| Geology | The BGS Geindex indicates that the superficial deposits comprise Warp and the bedrock is indicated to comprise the Mercia Mudstone Formation. |
| Hydrogeology | The Mercia Mudstone Formation which forms the bedrock at the site, is classified as a Secondary B Aquifer and the Warp as a Secondary A Aquifer. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | High |
| Potential contaminants | Heavy metals, ash, clinker, PFA, hydrocarbons, PCBs. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|---------------------|--|---|-------------------------------|--|-------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Medium | Unlikely. The site is outside of the Scoping Boundary and therefore unlikely to be disturbed by construction activities. | Low |
| | Leaching Migration Deposition | Groundwater (medium sensitivity) | Medium | Unlikely. The site is outside of the Scoping Boundary and therefore unlikely to be disturbed by construction activities. | Low |

| Site name/ref | PSC 37 – Small industrial estate and historically Walkeringham brick works |
|--|---|
| Site location and description | The Old Brickyard, Brickyard Lane, Doncaster DN10 4LZ (475371E, 392691N) The site currently comprises a small industrial estate in the east, with residential development and water features in the west. The site is bisected, approximately north/south by the Chesterfield Canal. |
| Site history | On the mapping dated 1885-1900 the site is labelled as a brick yard with a number of buildings present. By 1888-1913 the site is labelled on the maps as Walkeringham brick works, and there is evidence of workings on the site. Mapping dated 1937-1961 indicates that some of the workings have been infilled with water. The Google aerial imagery dated 2003 indicates the small industrial estate has been developed in the east, with additional buildings in the west together with a water feature/water filled pit. By 2015 the aerial imagery indicates the northern half of the industrial estate has been expanded, and by 2020 imagery indicates the area to the east of the industrial estate is under development. The 2021 aerial imagery indicates two additional water features. |
| Other pertinent information | Anecdotal evidence from an internet search reveals that once brick making ceased at the site it was used for creating silver cleaning powder with the eastern bank being used as a timber and saw mill. |
| Geology | The BGS Geindex indicates that superficial deposits are absent at this location and the bedrock is indicated to comprise the Mercia Mudstone Formation. |
| Hydrogeology | The Mercia Mudstone Formation which forms the bedrock at the site, is classified as a Secondary B. The site is not located within a SPZ or a Drinking Water Safeguarded Zone for groundwater. |
| Environmental setting | None |
| Potential for generating contamination | Moderate |
| Potential contaminants | Heavy metals, PCB, PAH, asbestos, hydrocarbons, coal and associated ash, organic compounds, solvents. |
| Potential receptors | Human health – construction/maintenance workers Groundwater |

| Potential source | Potential pathway | Potential receptors and sensitivity | Classification of consequence | Classification of probability | Risk rating |
|-------------------------|--|---|--------------------------------------|--|--------------------|
| Contaminated ground | Ingestion Inhalation Direct dermal contact | Construction/maintenance workers (high sensitivity) | Mild | Unlikely. The site is outside of the Scoping Boundary and therefore unlikely to be disturbed by construction activities. | Very low |
| | Leaching Migration Deposition | Groundwater (low sensitivity) | Minor | Unlikely. The site is outside of the Scoping Boundary and therefore unlikely to be disturbed by construction activities. | Very low |

11.A.4 References

- Ref 11.A.1 British Geological Survey Geindex Onshore (2023) [Online]. Available at: <https://mapapps2.bgs.ac.uk/geindex/home.html> [Accessed March 2023]
- Ref 11.A.2 Department for Environment, Food & Rural Affairs (2023). Multi-Agency Geographic Information for the Countryside (MAGIC) website. [Online]. Available at: <https://magic.defra.gov.uk/> [Accessed: 15.06.2023].
- Ref 11.A.3 Environment Agency Historic Landfill Sites (2023) [Online]. available at: <https://www.data.gov.uk/dataset/17edf94f-6de3-4034-b66b-004ebd0dd010/historic-landfill-sites> [Accessed March 2023]
- Ref 11.A.4 Environment Agency Permitted Waste Sites-Authorised Landfill Site Boundaries (2023) [Online]. Available at: <https://www.data.gov.uk/dataset/ad695596-d71d-4cbb-8e32-99108371c0ee/permitted-waste-sites-authorised-landfill-site-boundaries> [Accessed March 2023]
- Ref 11.A.5 Environment Agency Environmental Pollution Incidents (Category 1 and 2) (2023) [Online]. Available at: <https://www.data.gov.uk/dataset/c8625e18-c329-4032-b4c7-444b33af6780/environmental-pollution-incidents-category-1-and-2> [Accessed June 2023]
- Ref 11.A.6 National Library of Scotland – map images (2023) [Online]. Available at: <https://maps.nls.uk/geo/explore/side-by-side/#zoom=5&lat=56.00000&lon=-4.00000&layers=1&right=ESRIWorld> [Access March 2023]
- Ref 11.A.7 Britain from Above (2023) [Online]. Available at: <https://britainfromabove.org.uk/en> [Accessed March 2023]
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11.B Preliminary Qualitative Minerals Resource Assessment

Contents

| | | |
|---------------|--|-----------|
| 11.B.1 | Introduction | 1 |
| 11.B.1.1 | Overview | 1 |
| 11.B.1.2 | The Project | 1 |
| 11.B.1.3 | Need for the Project | 2 |
| 11.B.2 | Minerals Policy and Planning | 3 |
| 11.B.2.1 | National Policy Statement | 3 |
| 11.B.2.2 | National Planning Policy Framework | 3 |
| 11.B.2.3 | Local Planning Policy | 4 |
| 11.B.2.4 | Local Aggregate Assessments | 5 |
| 11.B.3 | Existing Baseline | 7 |
| 11.B.3.1 | Mineral Composition and Thickness | 7 |
| 11.B.4 | Assessment | 9 |
| 11.B.4.1 | Effects of the Project on Safeguarded Extents | 9 |
| 11.B.4.2 | Effects of the Project on Existing Minerals Infrastructure | 9 |
| 11.B.4.3 | Engineering and Construction Considerations | 9 |
| 11.B.5 | Conclusion | 11 |
| 11.B.6 | References | 13 |

11.B.1 Introduction

11.B.1.1 Overview

- 11.B.1.1.1 This Minerals Resource Assessment (MRA) has been produced to inform **Chapter 11, Geology and Hydrogeology** of the Scoping Report for the North Humber to High Marnham Project (the Project). This appendix has been prepared to provide baseline information on minerals present within the study area and identify the potential effects of the Project on Mineral Safeguarding Areas (MSA) and/or Mineral Consultation Areas (MCA) with the purpose of establishing the potential impact on mineral resources of economic importance and to consider whether further consideration and mitigation is required.
- 11.B.1.1.2 As described in **Chapter 11, Geology and Hydrogeology** of the Scoping Report, the study area for geology comprises the Scoping Boundary plus a 250 m buffer.
- 11.B.1.1.3 This MRA has been written with regard to Minerals Safeguarding Practice Guidance (Ref 11.B.1) which provides guidance on the scope and format of the MRA.

11.B.1.2 The Project

- 11.B.1.2.1 The Project is at an early stage of development; however, the indicative project components are set out below:
- works to facilitate the connection of a new overhead line (OHL) into a proposed new substation, close to the existing Creyke Beck Substation in the East Riding of Yorkshire;
 - a new 400 kV OHL route, approximately 90 km in length between a proposed new substation close to the existing Creyke Beck Substation and a proposed new substation close to the existing High Marnham Substation;
 - reconfiguration of a section of the existing 400 kV ZDA¹ OHL to the east of Crowle and west of Keadby Power Station, potentially including cable sealing end compounds (CSEC's), to facilitate the crossing of the new OHL;
 - works to facilitate the connection of a new OHL into a proposed new substation close to the existing High Marnham Substation, in Bassetlaw District in Nottinghamshire;
 - potential cable sealing end compounds and/or tunnel head houses for any underground cable sections of the Project;
 - potential alterations to sections of existing transmission OHLs (such as 4ZQ, 2KN, 4KG, 4TM, ZDA, 4VE, 4VK, and/or 4ZM); and
 - potential for removal/reconfiguration/diversion of utility assets.
- 11.B.1.2.2 Further details on the Project description can be found within **Chapter 4, Description of the Project**.

¹ ZDA route running between Drax, Keadby and Thorpe Marsh substations

11.B.1.2.3 For ease of reference, and to help make the baseline information more relevant to local communities the route has been divided by local authority sections as follows:

- East Riding of Yorkshire;
- North Lincolnshire; and
- Bassetlaw District (Nottinghamshire County Council).

11.B.1.3 Need for the Project

11.B.1.3.1 The need for the Project is set out in **Volume 1, Chapter 1, Introduction**.

11.B.2 Minerals Policy and Planning

11.B.2.1 National Policy Statements

- 11.B.2.1.1 As described in **Volume 1, Chapter 2, Regulatory and Planning Policy Context**, of the Scoping Report, when determining an application for development consent, the Planning Inspectorate is required to have regard for the relevant National Policy Statements (NPS). The two relevant NPS for the Project are the Overarching NPS for Energy (EN-1) (Ref 11.B.2) and the NPS for Electricity Networks Infrastructure (EN-5) (Ref 11.B.3), alongside the revised draft EN-1 and EN-5.
- 11.B.2.1.2 Paragraph 5.10.9 of EN-1 states
“Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place”.
- 11.B.2.1.3 Paragraph 5.10.22 states
“Where a proposed development has an impact upon a Mineral Safeguarding Area (MSA), the IPC [Infrastructure Planning Commission] should ensure that appropriate mitigation measures have been put in place to safeguard mineral resources”.
- 11.B.2.1.4 Although the relevant NPS provide the primary policy against which the Project should be decided, regional and local policy documents may also be considered important and relevant to decision-making. Therefore, the relevant minerals plans have been considered when developing this MRA.

11.B.2.2 National Planning Policy Framework

- 11.B.2.2.1 The National Planning Policy Framework (NPPF) (Ref 11.B.4) paragraphs 209 to 214 describe how planning policies should facilitate the sustainable use of minerals.
- 11.B.2.2.2 Paragraph 210 states that
“Planning policies should:...
c) Safeguard mineral resources by defining Mineral Safeguarding Areas and Mineral Consultation Areas; and adopt appropriate policies so that known locations of specific mineral resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resource defined will be worked); and
d) set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place”.
- 11.B.2.2.3 The NPPF also states in paragraph 213 that
“Minerals planning authorities should plan for a steady and adequate supply of aggregates by: ...

f) maintaining landbanks of at least 7 years for sand and gravel ... whilst ensuring that the capacity of operations to supply a wide range of materials is not compromised”.

- 11.B.2.2.4 The Minerals Planning Practice Guidance (Ref 11.B.5) states in paragraph 002 that *“since minerals are a non-renewable resource, minerals safeguarding is the process of ensuring that non-minerals development does not needlessly prevent the future extraction of mineral resources, of local and national importance”.*

11.B.2.3 Local Planning Policy

East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan

- 11.B.2.3.1 The East Riding of Yorkshire and Kinston upon Hull, Joint Minerals Local Plan (Ref 11.B.6) indicates that large parts of the study area are located within an MSA.
- 11.B.2.3.2 Broomfleet is indicated in the Joint Minerals Local Plan as an important deposit of brick clay which has been worked for over 100 years and is used in the manufacture of a range of roofing tiles and bricks. The Wienerberger Ltd clay works at Broomfleet is located within the Scoping Boundary and is a current consented extraction site which currently has planning permission to extract mineral (clay) for the next 50 years.
- 11.B.2.3.3 There are no other consented extraction sites, site allocations or proposed allocation sites within the study area.
- 11.B.2.3.4 Policy EC6: Protecting mineral resources;- of the East Riding Local Plan Strategy Document that forms part of the Joint Minerals Local Plan^{Error! Bookmark not defined.} states that *“within or adjacent to Minerals Safeguarding Areas non minerals development, which would adversely affect the viability of exploiting the underlying or adjacent deposit in the future, will only be supported where it can be demonstrated that the:*
- i. Underlying or adjacent mineral is of limited economic value;*
 - ii. Need for the development outweighs the need to safeguard the mineral deposit;*
 - iii. Non-mineral development can take place without preventing the mineral resource from being extracted in the future;*
 - iv. Non-mineral development is temporary in nature; or*
 - v. The underlying or adjacent mineral deposit can be extracted prior to the non-mineral development proceeding, or prior extraction of the deposit is not possible”.*

North Lincolnshire Local Development Framework

- 11.B.2.3.5 The North Lincolnshire Local Development Framework (LDF) (Ref 11.B.7) and the corresponding interactive policy map (Ref 11.B.8) indicates that much of the study area within North Lincolnshire is located within a MSA for sand and gravel. The southern part of the study area within North Lincolnshire also includes a MSA for

brick clay. However, there are no existing consented extraction sites, site allocations or proposed allocation sites within the study area.

11.B.2.3.6 Policy CS21 of the Core Strategy: Minerals;- states that *“Major developments in the Mineral Safeguarding Areas will only be permitted where it has been demonstrated that:*

a) the mineral is no longer of any value, or

b) the mineral can be extracted prior to the development taking place, or

c) the development will not inhibit extraction if required in the future, or

d) there is an overriding need for the development and prior extraction cannot be reasonably undertaken, or

e) the development is allocated in a local development plan document, or

f) the development is not incompatible”.

Nottinghamshire Minerals Local Plan

11.B.2.3.7 The Nottinghamshire Minerals Local Plan (Ref 11.B.9) indicates that the majority of the study area within Nottinghamshire is not within a MSA and does not intersect any minerals development or infrastructure. The exception to this is within the northern most part of this section which is within a MSA for sands and gravels.

11.B.2.3.8 Policy SP7: Minerals Safeguarding, Consultation Areas and Associated Minerals Infrastructure of the Minerals Local Plan states that:

“2. Non-minerals development within minerals safeguarding areas will have to demonstrate that mineral resources will not be needlessly sterilised as a result of the development and that the development would not pose a serious hindrance to future extraction in the vicinity.

3. Where this cannot be demonstrated, and where there is a clear and demonstrable need for the non-minerals development, prior extraction will be sought where practicable”.

11.B.2.4 Local Aggregate Assessments

Humber Area Local Aggregate Assessment

11.B.2.4.1 The current landbank for various aggregates for any given Minerals Planning Authority (MPA) is usually documented in a Local Aggregate Assessment (LAA), which reports annually (generally) on aggregate supply and demand within the relevant planning area. The Humber Area Local Aggregate Assessment (Ref 11.B.10) covers the sections of the study area that are within the East Riding of Yorkshire and also North Lincolnshire; with the most recent LAA currently available for these sections reflecting the position at the end of 2018.

11.B.2.4.2 The LAA contains the following information in relation to sand and gravel:

- **Sand and gravel sales:** The average aggregate sales for sand and gravel for the most recent ten-year rolling period (2009 to 2018), and three-year rolling period (2016 to 2018), are 0.83 million tonnes per annum (mtpa) and 0.89

mtpa respectively. The sales have been noted to be broadly consistent over the last 10 years.

- **Sand and gravel landbank:** Reserves (as of 31 December 2018) were 7.32 million tonnes which is an increase of 1.59 million tonnes compared with 2017 levels. Based on the average sales for the most recent ten-year rolling period, the landbank currently stands at 8.82 years which is an increase from 2017. This is in excess of the seven-year requirement set out in the NPPF and policy CS21 of the Core Strategy in the LDF.
- **Extraction sites:** At the time the LAA was produced, there were 10 active sites extracting sand gravel, with a further 5 sites which were dormant or inactive.

11.B.2.4.3 The evidence from the LAA indicates that there is no current or foreseeable shortage of sand and gravel reserves.

Nottinghamshire and Nottingham Local Aggregates Assessment

11.B.2.4.4 The Nottinghamshire and Nottingham LAA (Ref 11.B.11) covers the Bassetlaw section of study area, with the most recent LAA reflecting the position at the end of 2021. The LAA contains the following relevant information:

- **Sand and gravel sales:** The 10-year average sales figures (2012-2021) was 1.37 million tonnes (mt) which has steadily fallen since the first LAA was produced. The three-year annual sales average (2019-2021) was 1.22 mt and has also slowly fallen.
- **Sand and gravel landbank:** The current permitted reserves total 21.49 mt of sand and gravel therefore as of December 2021 the landbank stood at 15.69 years which is in excess of the seven-year requirement set out in the NPPF. It is also noted that the landbank has been steadily increasing due to a significant extension being granted to one of the permitted quarries and as the 10-year sales average has also been decreasing.
- **Extraction sites:** There are currently eight permitted sand and gravel quarries in the region, with only six of those in full production.

11.B.2.4.5 The evidence from the LAA suggests that the demand for sands and gravels has been decreasing and therefore the landbank of permitted reserves is slowly increasing. It is therefore considered that there is no current or foreseeable shortage of sand and gravel and that the existing landbank is adequate.

11.B.3 Existing Baseline

11.B.3.1 Mineral Composition and Thickness

11.B.3.1.1 The geology in the study area is shown in Volume 2, **Figure 11.1** and **Figure 11.2** and discussed within the Geology and Hydrogeology scoping report chapter.

Mineral Assessment Reports

11.B.3.1.2 There are two relevant Minerals Assessment Reports (MAR) which cover the northern part of North Lincolnshire and the most northern part of the Bassetlaw section in the study area. The MAR are a series of reports that describe the mineral resources across areas of the United Kingdom. The reports were produced using data gathered from borehole surveys and contain qualitative and quantitative data on lithology, composition, particle size analysis and other information of commercial value.

Minerals Assessment Report 22

11.B.3.1.3 MAR 22 (Ref 11.B.12) covers the northern part of the North Lincolnshire section. The MAR subdivides the area covered into resource blocks where the mineral is then sub divided into areas where it is exposed and areas where it is present beneath overburden.

11.B.3.1.4 The study area crosses through resource blocks A, B, C and D which are all described as being in area where there is *“continuous or almost continuous spreads of mineral beneath overburden”* with the overburden ranging from 7 m in resource block A in the north of the section, to 1.5 m in the southern part of the MAR area in resource block D, south of Eastoft. A review of the descriptions of each resource block indicates that there is the potential for workable mineral to be present, based on the boreholes reviewed by the MAR; however, it is often confined by substantial thicknesses of overburden.

Minerals Assessment Report 43

11.B.3.1.5 MAR 43 (Ref 11.B.13) covers the northern part of the Bassetlaw section. The study area crosses resource blocks C and D within the northern part of the section and then crosses into an area to the south of resource blocks C and D which is described as *“sand and gravel either not potentially workable or absent”*.

11.B.3.1.6 Resource block C was described as mineral bearing; however, sand and gravel was not encountered in some boreholes and the thickness of the mineral where encountered was found to be variable with overburden of sandy soil up to 1.5 m thick.

11.B.3.1.7 Resource block D was also described as mineral bearing, and the thickness of the mineral varies from 1.8 m to 9.4 m. The mineral is noted to be entirely covered by a thin layer of alluvial clays and silts.

Summary

- 11.B.3.1.8 The MARs only cover a very small part of the overall study area, with MAR 43 showing that the majority of the study area covered by that report is within an area where the mineral is absent, which is consistent with the minerals local plan for the area.
- 11.B.3.1.9 The reports show that mineral is likely to be present in parts of the route however is also likely to be covered by a thick layer of overburden in North Lincolnshire. In the north of Bassetlaw this route only crosses a very small section of potentially extractable mineral.

11.B.4 Assessment

11.B.4.1 Effects of the Project on Safeguarded Extents

- 11.B.4.1.1 The policies maps accompanying the relevant minerals plans indicate that much of the Scoping Boundary is located within safeguarded areas – predominantly for sands and gravels and brick clay. However, the Scoping Boundary is the largest extents of the area within which the Project may be placed and does not represent the potential area where mineral may be sterilised by the Project. Likewise, the refined Order Limits that will be defined in later stages of the Project will cover the entire working area of the Project and will not represent the actual (much smaller) potential area where mineral may be sterilised by the Project. The actual physical footprint of the operational Project components is a relatively small proportion of the Scoping Boundary and future Order Limits.
- 11.B.4.1.2 At the current time, the entire route is proposed to be overhead line which comprises pylons, spaced between approximately 250 m to 450 m apart, and the conductors which span between the pylons. The conductors would not result in sterilisation of minerals, as minerals could be extracted from beneath the overhead line. Therefore, potential areas of sterilisation of the mineral relate only to the pylon bases, CSEC's and proposed new substations.
- 11.B.4.1.3 In addition, based on the information from the MRAs and the published geology of the area, the pylon bases are likely to be within overburden material for at least some of the route, therefore the mineral would not require excavating and would remain beneath the pylon bases in these cases. If the pylons were decommissioned and removed in the future the mineral could still be extracted.

11.B.4.2 Effects of the Project on Existing Minerals Infrastructure

- 11.B.4.2.1 The Wienerberger Ltd extraction site, for brick clay, is located within the Scoping Boundary and there is the potential for the Project to have an impact on the existing minerals infrastructure. If in due course the Order Limits interact with the site, early engagement will be undertaken with the minerals operator to ensure that any impacts to the site are minimised.

11.B.4.3 Engineering and Construction Considerations

- 11.B.4.3.1 Prior extraction refers to the removal of a mineral resource, to prevent sterilisation, prior to the commencement of construction works on a project. Incidental extraction refers to the removal of a mineral resource during the construction of the Project. In this case, incidental extraction is not considered feasible due to the likely engineering requirements needed following mineral extraction, to create an appropriate development platform for the Project, which would have a significant impact on the construction programme.
- 11.B.4.3.2 Any prior extraction at pylon bases (pylon working areas would typically be 75 m by 75 m) is likely to produce a very small quantity of extractable mineral and would also need to include an area significantly bigger than both the proposed pylon bases and

any excavations proposed to facilitate their construction (for reasons of practicality and stability). The mineral would then have to be replaced by appropriate material which may need to be engineered to meet any specific geotechnical design requirements for the pylon bases. This is likely to require significant additional cost to over excavate, replace with imported material, engineer the material and to provide the suitable stability assessments and specifications required to demonstrate/facilitate short and long term stability of the excavations and the pylons. The potential environmental impacts (noise, dust, traffic, landscape and visual) of prior extraction are likely to require environmental assessment/consideration due to the cumulative scale.

- 11.B.4.3.3 In order to reduce the potential costs associated with prior/incidental extraction, National Grid could replace the excavated mineral with inert waste. However, this is unlikely to be practical in the context of the discrete relatively small areas and would require additional designs and engineering to fully understand the design implications.
- 11.B.4.3.4 In addition, the use of inert waste would require separate additional applications to be made to the Environment Agency for environmental permits (for a waste recovery activity) including supporting risk assessments such as hydrogeological risk assessments and stability risk assessments. This is likely to result in both additional cost and delay to the programme affecting both National Grid's duty to be economic and efficient and put at risk meeting the proposed operation date.
- 11.B.4.3.5 It is considered that due to the long relatively narrow corridor that will comprise the future Order Limits, and with extraction only considered in the pylon working area, cable sealing end compounds (CSEC's) and underground sections, this would limit the potential for either prior or incidental extraction in the context of the relatively low volume of mineral likely to be extracted. This is before consideration of the quality and value of the mineral (which may further reduce the volume). The cumulative costs of extraction of the mineral, the transport of the mineral to an off-site facility for processing and the subsequent infilling of the void (either with inert waste or engineered fill), together with the potential environmental implications and geotechnical engineering enhancement needed to provide an appropriate material on which to construct the Project is considered to significantly outweigh the economic value of the extracted mineral.

11.B.5 Conclusion

- 11.B.5.1.1 National Grid acknowledges that large parts of the study area are located within a MSA, which also extend beyond the study area, across substantial areas of the East Riding of Yorkshire, North Lincolnshire and Nottinghamshire as well as passing through the Broomfleet brick clay extraction site. Even if the full extent of the Scoping Boundary within a MSA were to sterilise mineral of sufficient quality and extent to be economically valuable, the extent of the sterilised area is very small in comparison to the extent of the MSA. Therefore, in the context that only a relatively small proportion of the overall Order Limits will sterilise potential mineral resource, the quantity of mineral that could be sterilised by the Project is considered to be insignificant in the context of the extensive occurrence of the minerals (predominantly sand and gravel) within the counties and the national need/significance of the Project.
- 11.B.5.1.2 In addition, whilst there are mineral deposits safeguarded within the Scoping Boundary, the existence, extent and quality of such is not proven and is anticipated to be highly variable. Therefore, not all of the safeguarded areas may contain mineral, or mineral of sufficient quality or economically value.
- 11.B.5.1.3 The Wienerberger Ltd extraction site for brick clay is also located within the study area and should the future order limits interact with the site, then National Grid will engage with the mineral operator to discuss potential mitigation if appropriate.
- 11.B.5.1.4 Consideration has been given to prior extraction of minerals as part of the Project construction programme. This has shown that there are likely to only be small discrete areas of the Project where material could be excavated due to the linear nature of the Project, making it impractical. This has also shown that the increase in cost associated with the extraction would increase the overall cost of the entire project and would conflict with National Grid's duty to be economic and efficient.
- 11.B.5.1.5 In addition, the additional time that would need to be added to the construction schedule would mean that National Grid could miss the Project's intended delivery date, which could also risk the meeting of the Government's net zero ambitions. Therefore, it is considered that in the context of the additional cost and time required, prior/incidental extraction in these areas is not viable.
- 11.B.5.1.6 The NPPF encourages prior extraction of minerals 'where practical and feasible', and this MRA indicates that this requirement is not met on the Project as it would not be practical to extract the mineral prior to development.
- 11.B.5.1.7 The Project is also considered to be of national significance, and therefore the need for the Project *"outweighs the need to safeguard the mineral deposit"* which is one of the statements within Policy EC6 of the East Riding of Yorkshire and Kingston upon Hull, Joint Minerals Local Plan^{Error! Bookmark not defined.} therefore the Project complies with this policy. Policy CS32 of the North Lincolnshire Local Development Plan^{Error! Bookmark not defined.} states that where *"there is an overriding need for the development and prior extraction cannot be reasonably undertaken"* major development can be permitted in an MSA, and it is considered that the Project complies with this policy.

- 11.B.5.1.8 In addition, this Project complies with Policy SP7 of the Nottinghamshire Minerals Local Plan, specifically “...*where there is a clear and demonstrable need for the non-minerals development*”.
- 11.B.5.1.9 Based on the national significance of the Project and that all affected authorities have more than the seven-year land bank of sand and gravel, as required by the NPPF, and sufficient additional safeguarded areas, it is considered that the potential impact of sterilising the small volume associated with the Project is acceptable without further consideration or mitigation.

11.B.6References

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Ref 11.B.13 Institute of Geological Sciences (1979). The sand and gravel resources of the country around Misterton, Nottinghamshire.

19.A Major Accidents and Disasters Scoping Table

Appendix 19.A Major Accidents and Disasters Scoping Table

Table 19.A.1 Major accidents and disasters scoping table

| Major event group | Major event category | Major event type | Basis of decision to scope in/out | Proposed to be scoped in? |
|-------------------|----------------------|-------------------|--|---------------------------|
| Natural hazards | Geophysical | Earthquakes | <p>Earthquakes in the UK are moderately frequent but are unlikely to be powerful enough to inflict severe damage.</p> <p>The British Geological Society (BGS) acknowledges although the UK is distant from the nearest plate boundary, the Mid-Atlantic Ridge, earthquakes in the UK occur as crustal stresses within the tectonic plates are relieved by movement occurring on pre-existing fault planes. One of the driving forces is regional compression caused by motion of the Earth's tectonic plates and uplift resulting from the melting of the ice sheets that covered many parts of Britain thousands of years ago.</p> <p>The Project is not considered to be vulnerable to earthquakes of the level experienced in the UK. It is also unlikely to trigger earthquakes.</p> | No |
| Natural hazards | Geophysical | Volcanic activity | <p>According to the National Risk Register – 2020, there are a number of volcanoes across Europe that could affect the UK, especially volcanoes in Iceland (such as Bárðarbunga and Eyjafjallajökull) due to their proximity to the UK and because there are frequent eruptions. Due to prevailing winds, they have potential to blow ash and gas towards the UK.</p> | No |

| | | | | |
|-----------------|-------------|----------------------|--|----|
| | | | It is highly unlikely that an ash cloud could significantly impact on any aspect of the Project. | |
| Natural hazards | Geophysical | Landslides | The BGS is the definitive source of landslide information in Great Britain. The National Landslide Database shows there have been no landslides recorded within the Project Scoping Boundary. The Project's topography is relatively flat with gently undulating land. The Project does not involve the formation of deep cuts/high embankments. In designing the Project to applicable standards, resources and receptors would not be put at a greater risk as a consequence of the Project. | No |
| Natural hazards | Geophysical | Sinkholes | The superficial and bedrock geology within the Project Scoping Boundary is described in Chapter 11, Geology and Hydrogeology . Due to the nature of the superficial and bedrock geology within the Project Scoping Boundary sinkholes are unlikely. | No |
| Natural hazards | Geophysical | Tsunamis | The Project is not located in a tsunami risk zone. | No |
| Natural hazards | Hydrology | Tidal flooding | The Flood Risk Assessment (FRA) undertaken as part of Chapter 10, Water Environment will assess the vulnerability of the Project to flood risk and the risk that the Project could increase flood risk elsewhere. National Grid designs its infrastructure to either withstand a flood event or to be raised up out of the floodplain. The construction of the Project will incorporate appropriate post construction surface water management and land drainage systems if necessary. The detailed scope of the FRA will be agreed with relevant stakeholders but the construction, operation, and maintenance of the Project is not considered to be susceptible to flooding and is unlikely to cause flooding elsewhere. | No |
| Natural hazards | Hydrology | Fluvial flooding | | No |
| Natural hazards | Hydrology | Pluvial flooding | | No |
| Natural hazards | Hydrology | Groundwater Flooding | | No |

| | | | | |
|-----------------|-----------------------------------|--|--|----|
| Natural hazards | Hydrology | Avalanches | Avalanches are not considered relevant given the location of the Project. | No |
| Natural hazards | Climatological and meteorological | Cyclones, hurricanes, typhoons, storms and gales | Cyclones, hurricanes, typhoons do not typically occur in the UK. Storms and gales could result in damage to the OHL. However, they will be designed in line with UK standards which take into account environmental conditions including exposure to UK weather conditions. The risk is not significantly different to other similar infrastructure in the locality. | No |
| Natural hazards | Climatological and meteorological | Thunderstorms | Storms of sufficient severity to cause damage to infrastructure are very rare in the UK. Lightning could potentially strike above ground installations including pylons. However, these have earthing protection against lightning strikes as set out in existing Technical Standards. Storms could be a source of high wind speeds. The underground cables would not be liable to the effects of high winds. Overhead lines could be subject to high wind speeds; however, these are designed to meet current safety standards. If in an extreme scenario the overhead line were to be damaged, the monitoring system would detect the fault within milliseconds and the circuit would be tripped. This would occur before the overhead line (conductor) hits the ground and there would be no resulting risk of electrocution or fire. | No |
| Natural hazards | Climatological and meteorological | Wave surges | The northern section of the Project is located in a flood risk area; however, the majority of the electrical infrastructure will be on pylons that are approximately 50 m tall and therefore would not be subjected to flooding. | No |
| Natural hazards | Climatological and meteorological | Extreme temperatures: | This type of event could expose site infrastructure to greater heat intensity and exposure to sunlight. Heavy | No |

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| | | heatwaves, low (sub-zero) temperatures and heavy snow | <p>snow could cause disruption to workers and delivery vehicles and drivers during construction.</p> <p>High temperature records are now being broken across the UK with increasing frequency. Data sourced from the UK Met Office summarises the highest daily maximum temperature in the UK is 40.3°C, recorded in Coningsby, Lincolnshire in July 2022.</p> <p>The lowest daily minimum temperature on record in the UK is -27.2°C recorded in Altnaharra, Scotland in December 1995. In late February and early March 2018, the UK experienced a spell of severe winter weather with very low temperatures and significant snowfall. Climate change is set to lead to more extreme events over the coming years.</p> <p>The Project will be designed to existing National Grid standards, which include consideration of high temperatures. National Grid also undertakes regular inspections of the network using thermal imaging to assess damage from weather.</p> | |
| Natural hazards | Climatological and meteorological | Droughts | Drought has the longest advance warning times of the severe weather types. The Project would not be vulnerable to drought. | No |
| Natural hazards | Climatological and meteorological | Severe space weather: solar flares | The energy from solar flares reaches Earth within a few minutes and can cause radio blackouts. Solar energetic particles arrive at Earth around 15 minutes to a few hours after they occur and cause solar radiation storms which can potentially harm astronauts and impact electronics. CMEs travel slowly and can take between 14 hours and up to four days to reach Earth and cause geomagnetic storms with many impacts including localised disruptions to power grids | No |
| Natural hazards | Climatological and meteorological | Severe space weather: solar energetic particles | | No |
| Natural hazards | Climatological and meteorological | Severe space weather: coronal | | No |

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| | | mass ejections (CMEs) | However, in designing the Project to applicable standards, resources and receptors would not be put at a greater risk as a consequence of the Project. | |
| Natural hazards | Climatological and meteorological | Fog | Fog is one of the most common weather conditions in the UK, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50 m over a wide area. Should fog become an issue during the construction phase due to visibility, work would cease, where it is not safe to continue until conditions improve. | No |
| Natural hazards | Climatological and meteorological | Wildfires: forest fire, bush/brush, pasture | In 2018, fire and rescue services dealt with a number of wildfires across the country. The vast majority of these were considered business as usual, although some larger incidents (including the Saddleworth Moor and Winter Hill fires) involved mutual aid from other services and the use of specialist capabilities such as high-volume pumps. Scotland also experiences large, rural wildfires, most recently seen in Dumfries and Galloway in 2020. The Project would include standoff distances from wooded areas and landscape planting, in order to minimise the risk of vegetation contacting the OHL and potentially igniting a fire. Should weather conditions during construction become hot and dry for a long period of time, further consideration would be given to hot work activity locations. | No |
| Natural hazards | Climatological and meteorological | Poor air quality | Between 27 June and 7 July 2006, and between 13 and 23 July of the same year, the UK experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. In the first episode, the combination of heatwave conditions, poor air quality and worsening of people's pre-existing conditions led to up to 540 deaths and up to 700 hospital admissions. The same factors led to up to | No |

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| | | | <p>630 deaths and up to 830 hospital admissions in the second episode. Periods of elevated pollution over a widespread area, and lasting more than two days, can occur around 5 to 10 times a year dependent on seasonal weather conditions.</p> <p>The proposed scope of the air quality assessment is set out in Chapter 14, Air Quality. No potential significant air quality effects are predicted from the Project.</p> <p>During operation of the Project there is unlikely to be any effect on air quality as maintenance vehicles would be very few and there are no emissions associated with the operation of the Project itself.</p> | |
| Natural hazards | Biological | <p>Disease epidemics:</p> <ul style="list-style-type: none"> viral bacterial parasitic fungal prion | <p>The construction and operation of the Project would not give rise to any disease epidemics. The development itself would be constructed following all necessary guidance and restrictions in place at the time of its construction relating to the control of COVID-19.</p> | No |
| Natural hazards | Biological | <p>Animal Diseases:</p> <ul style="list-style-type: none"> zoonotic: <ul style="list-style-type: none"> avian influenza West Nile virus rabies non-zoonotic: <ul style="list-style-type: none"> foot and mouth swine fever | <p>The Project would not be a source of any disease epidemics and spread during any outbreak would be controlled through containment of infected animals including prohibition of transportation. The Project will adopt strict biosecurity protocols when working between livestock/poultry farms and these measures would form part of the Construction Environmental Management Plan (CEMP).</p> | No |
| Natural hazards | Biological | Plants | <p>Standard control measures would be implemented by the appointed contractor during construction to handle and dispose of any diseased or invasive plants to</p> | No |

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| | | | prevent their spread. Measures, such as a biosecurity plan as set out in measure BE01 of Appendix 4.A Outline Code of Construction Practice would be put in place for the Project. |
| Technological or manmade hazards | Societal | Extensive public demonstrations which could lead to violence and loss of life. | <p>In recent decades, serious widespread disorder in the UK has been rare. On 6 August 2011, a protest in Tottenham following the shooting of Mark Duggan by the police escalated into widespread public disorder. The G20 summits in 2009 and 2017 resulted in varying degrees of violent disorder, while the tuition fees protest in 2010 saw incidents of criminal damage and use of improvised missiles against police. The Project is located in a largely rural area of the UK, and despite the isolated cases listed above, the UK is considered to be a politically stable country. The Project should not lead to civil unrest, widespread damage to societies and economies and is unlikely to require largescale multi-faceted humanitarian assistance.</p> |
| Technological or manmade hazards | Societal | Widespread damage to societies and economies. | |
| Technological or manmade hazards | Societal | The need for largescale multifaceted humanitarian assistance. | |
| Technological or manmade hazards | Societal | The hindrance or prevention of humanitarian assistance by political and military constraints | |
| Technological or manmade hazards | Societal | Significant security risks for humanitarian relief workers in some areas. | |

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| Technological or manmade hazards | Societal | Famine | The Project is located in a developed country that produces its own crops and imports food. It is politically stable and not subject to hyperinflation and therefore food is available, whether produced within the UK or imported. Famine is also not relevant to the use of the Project. | No |
| Technological or manmade hazards | Societal | Displaced population | The Project is located in a developed country which is politically stable. There will be no significant displacement of populations as part of the Project. | No |
| Technological or manmade hazards | Industrial and urban accidents | Major accident hazard chemical sites | There are no establishments within the 3 km of the Project Scoping Boundary that are covered by the Control of Major Accident Hazard (COMAH) Regulations 2015. The Project would not lead to any increased risk of a major accident or disaster from a COMAH site. | No |
| Technological or manmade hazards | Industrial and urban accidents | Major accident hazard pipelines | The Project would not lead to any increased risk of a major accident or disaster from a major accident hazard pipeline. | No |
| Technological or manmade hazards | Industrial and urban accidents | Nuclear | Nuclear sites are designed, built, and operated so that the likelihood of releases of radiological material in the UK is extremely low. The Project would not lead to any increased risk of a major accident or disaster from a nuclear site. | No |
| Technological or manmade hazards | Industrial and urban accidents | Fuel storage | The Project would not lead to any increased risk of a major accident or disaster from a fuel storage site. | No |
| Technological or manmade hazards | Industrial and urban accidents | Dam breaches | There are no reservoirs within the Project Scoping Boundary and the Project would not lead to any increased risk of a dam breach. Potential risks from reservoir flooding will be considered in the Flood Risk Assessment. The Project is not expected to lead to | No |

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| | | | any increased risk of major accident or disaster from reservoir flooding. | |
| Technological or manmade hazards | Industrial and urban accidents | Mines and storage caverns | <p>There are no Coal Authority Mine Entries located within the Project Scoping Boundary.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from mines and caverns.</p> | No |
| Technological or manmade hazards | Industrial and urban accidents | Fires | <p>Fires could be initiated by construction related activities however standard control measures would be implemented by the appointed contractor to manage the risk of fire. Measure GG20 of Appendix 4.A Outline Code of Construction Practice prohibits bonfires and the burning of water material on site.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from fires.</p> | No |
| Technological or manmade hazards | Transport accidents | Road | <p>Transport accidents occur across the UK on a daily basis.</p> <p>During construction there will be an increase in heavy construction plant and equipment on the local road network which would form the entry and exit points for construction traffic and therefore may increase the risk of road traffic accidents.</p> <p>Access points will incorporate appropriate visibility splays, turning radii and speed limit reductions where necessary/appropriate. Measures TT01, TT02, TT03 of Appendix 4.A Outline Code of Construction Practice set out measures to control and manage construction traffic on the highway network.</p> <p>The operation of the Project would not result in increased traffic flow or changes to traffic composition which could have an adverse impact on highway safety. The Project is not likely to lead to any</p> | No |

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| | | | increased risk of a major accident or disaster from road traffic accidents. | |
| Technological or manmade hazards | Transport accidents | Rail | There are railway lines within the Project Scoping Boundary. The Project will intersect four railway lines: The Selby Line, The Doncaster to Cleethorpes Line, The Gainsborough Line and The East Coast Line. The Project is not likely to lead to any increased risk of a major accident or disaster from rail accidents. | No |
| Technological or manmade hazards | Transport accidents | Waterways | The Project is not likely to lead to any increased risk of a major accident or disaster from marine vessel accidents. | No |
| Technological or manmade hazards | Transport accidents | Aviation | The Project is not likely to lead to any increased risk of a major accident or disaster from aviation accidents. An aviation report will be produced to identify all airfields and airstrips (identified in Chapter 16, Socio-economic, Recreation and Tourism) and will set out potential issues for each. Routeing and design of the project where possible will allow these airfields/airstrips to continue to operate safely. | No |
| Technological or manmade hazards | Pollution accidents | Air | The proposed scope of the air quality assessment is set out in Chapter 14, Air Quality . The Project is not likely to lead to any increased risk of a major accident or disaster from air pollution accidents. | No |
| Technological or manmade hazards | Pollution accidents | Land | Measures GG06, GG23, W02, and GH05 in Appendix 4.A Outline Code of Construction Practice will ensure control and management measures are in place to prevent pollution from the construction of the Project. The Project is not likely to lead to any increased risk of a major accident or disaster from land pollution accidents. | No |

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| Technological or manmade hazards | Pollution accidents | Water | <p>Measures GG06, GG23, W02, and GH05 in Appendix 4.A Outline Code of Construction Practice will ensure control and management measures are in place to prevent pollution from the construction of the Project.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from water pollution accidents</p> | No |
| Technological or manmade hazards | Utilities failure | Electricity | <p>Above-ground electrical transmission lines are present within the Scoping Boundary. During construction, any work required near electric overhead power lines would be adequately controlled and appropriate site-specific risk assessments completed which would consider such aspects as:</p> <ul style="list-style-type: none"> the voltage and height; size and reach of any machinery or equipment; safe clearance distances required; site conditions such as undulating terrain; and competence, supervision, training and briefing to staff. <p>The Project is not likely to lead to any increased risk of a major accident or disaster from an electricity utilities failure.</p> | No |
| Technological or manmade hazards | Utilities failure | Gas | <p>A gas transmission pipeline does intersect with the Project scoping boundary; however, the Project is not likely to lead to any increased risk of a major accident or disaster from a gas utilities failure.</p> | No |
| Technological or manmade hazards | Utilities failure | Water supply | <p>The project would be designed and constructed to appropriate design standards which include crossing of other utilities. Including consultation and agreement of protective provisions with the asset owners.</p> | No |

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| | | | The Project is not likely to lead to any increased risk of a major accident or disaster from a water supply utilities failure. | |
| Technological or manmade hazards | Utilities failure | Sewage system | The Project would be designed and constructed to appropriate design standards which include crossing of other utilities. Including consultation and agreement of protective provisions with the asset owners. The Project is not likely to lead to any increased risk of a major accident or disaster from a sewage system utilities failure. | No |
| Technological or manmade hazards | Malicious attacks | Unexploded Ordnance | UXO surveys will be undertaken, and the Project would be designed and constructed to appropriate design standards relevant to UXO. The Project is not likely to lead to any increased risk of a major accident or disaster from UXO. | No |
| Technological or manmade hazards | Malicious attacks | Chemical Biological Radiological Nuclear | The Project will form part of the National Transmission System. Measures are established to prevent such an attack. | No |
| Technological or manmade hazards | Malicious attacks | Transport systems | N/A | No |
| Technological or manmade hazards | Malicious attacks | Crowded places | N/A | No |
| Technological or manmade hazards | Engineering accidents and failures | Cyber | According to the National Risk Register 2020, cyber-attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. National Grid Electricity System Operator (ESO) must adhere to Security Quality of Supply Standards. | No |

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| | | | The Project is not likely to lead to any increased risk of a major accident or disaster from cyber-attacks. | |
| Technological or manmade hazards | Engineering accidents and failures | Infrastructure | N/A | No |
| Technological or manmade hazards | Engineering accidents and failures | Bridge failure | N/A | No |
| Technological or manmade hazards | Engineering accidents and failures | Flood defence failure | <p>The Project would be designed and constructed to appropriate design standards which include crossing of flood defences. Including consultation and agreement of protective provisions with the asset owners.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from a flood defence failure.</p> | No |
| Technological or manmade hazards | Engineering accidents and failures | Pylon collapse | <p>Pylons are designed with a wide base and deep concrete foundations to provide a stable footing. The pylons are designed and maintained to existing safety standards that mean it is highly unlikely that a pylon would collapse if something fell on it. The project's land rights would restrict development and structures that can be built near to pylons, and this also means that even if a pylon were to collapse it would not fall onto a nearby building or environmental receptor, as the land rights would limit such features.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from mast or tower collapse.</p> | No |
| Technological or manmade hazards | Engineering accidents and failures | Property or bridge demolition accidents | N/A | No |

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| Technological or manmade hazards | Engineering accidents and failures | Tunnel failure/fire | N/A | No |
| Technological or manmade hazards | Human error | Buried strike to existing buried services | <p>The protection of buried services is achieved through existing safety controls embedded during the design and construction stages. These include analysis of up-to-date service information to identify the location of services, holding discussions with service providers to agree protective provisions and managing the risks to services. Measures to manage risk include undertaking service location surveys to track where services are located on the ground.</p> <p>Works would also take into consideration Health and Safety and Environment (HSE) guidance (2014), which provides advice on how to reduce any direct risks to people's health and safety, as well as the indirect risks arising through damage to services. These existing measures reduce the risk to as low as reasonably practicable for the project to cause a service strike through human error.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from buried strike to existing buried services.</p> | No |
| Technological or manmade hazards | Human error | Damage to underground cable | Underground cables are placed at a minimum depth of 1.1 m (deep enough so as not to be affected by agricultural activities). The cables and ducts are placed in cement-bound sand with a tile over the top as added protection. Landowners would be made aware of the route of the cable and associated land rights which would outline the activities that can take place over the cable. In the extremely unlikely event that the cable was damaged, the fault would be reported in milliseconds through the monitoring | No |

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| | | | <p>system and the system would be auto-isolated, making it safe pending investigations.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from damage to underground cables.</p> | |
| Technological or manmade hazards | Human error | Crane operation | <p>Geotechnical investigations would be undertaken to identify the stability/suitability of the ground beneath where the crane would be placed, having an appropriately designed crane base plate, and using trained staff to operate the crane.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from crane operation.</p> | No |
| Technological or manmade hazards | Sabotage or arson | Sabotage or arson on proposed infrastructure | <p>During construction, the working areas would have security fencing around the sites and only authorised personnel would be admitted to the sites. Outside of working hours, it is anticipated that the sites would have the proper security measures such as: security guard/CCTV to check for trespassers that could result in sabotage or arson.</p> <p>The Project is not likely to lead to any increased risk of a major accident or disaster from sabotage or arson on the proposed infrastructure.</p> | No |

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