The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Volume 3: Appendix 12.1 Preliminary Contamination Risk Assessment

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nationalgrid

Contents

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1. Introduction

1.1.1 This preliminary contamination risk assessment has been produced to inform **Chapter 12 Geology and Hydrogeology** of the Preliminary Environmental Information Report (PEIR) for Project. This appendix has been prepared to provide baseline information on potentially contaminated land within the study area.

1.1.2 As described in **Chapter 12 Geology and Hydrogeology**, the study area for land contamination comprises the physical extents of the draft Order Limits plus a buffer of 250 m.

1.1.3 For ease of reference the Project has been split into 11 Route Sections which are described in **Chapter 4 Description of the Project**.

1.2 Structure of the Appendix

1.2.1 The structure of this assessment is as follows:

- Section 2 Geology – presents information of the geology encountered within the study area;
- Section 3 Methodology – presents information of the methodology followed in this appendix and the accompanying classification tables; and
- Section 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. This appendix 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.

1.3 Sources of Information

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 (Ref 12.1.1);
- BGS GeoIndex Viewer (Ref 12.1.2);
- Defra mapped information, via the MAGIC website (Ref 12.1.3) 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 and permitted landfill and waste sites, and category 1 and 2 pollution incidents (Ref 12.1.4);
- Georeferenced historical Ordnance Survey maps for the United Kingdom (Ref 12.1.5);
- Google Earth historical aerial imagery;
- Historical Aerial Photography; and
- Information on potentially contaminated land provided from East Riding of Yorkshire Council, North Lincolnshire Council and Bassetlaw Council.

2. Published Geology

2.1 Introduction

2.1.1 This section provides details of the geology present beneath the study area to inform the baseline conditions for the Project.

2.1.2 The published geology within the draft Order Limits and study area is shown on the Geological Survey of Great Britain (England and Wales), 1:50,000 scale geological maps (Ref 12.1.1), and the British Geological Survey online mapping (Ref 12.1.2). The 1:50,000 series mapping comprising the superficial and bedrock geology within the draft Order Limits is presented on **Figure 12.1 Superficial Geology** and **Figure 12.2 Bedrock Geology** and is summarised below.

2.2 Published Geology – Superficial Deposits

Route Section 1: Creyke Beck to Skidby

2.2.1 Superficial deposits are indicated to be present across the majority of the 250 m study area in Route Section 1: Creyke Beck to Skidby. The superficial deposits indicated to be present within the draft Order Limits predominantly comprise Till (Devensian), described by the BGS as "*diamicton*" often described as Boulder Clay. Other superficial geology encountered within the 250 m study area includes:

- sand and gravel of uncertain age and origin – indicated to be present in a localised area to the north of the draft Order Limits and described as '*sand and gravel with rare lenses of clay*';
- Head Deposits – indicated locally within riverbeds and described as '*gravel, sand and clay … locally with lenses of silt, clay or peat and organic material*'.

Route Section 2: Skidby to A63 Dual Carriageway

2.2.2 Superficial deposits are generally indicated to be absent across the majority of the 250 m study area in Route Section 2: Skidby to A63 Dual Carriageway with the exception of the following:

- Head Deposits – indicated locally within riverbeds and described as "*gravel, sand and clay … locally with lenses of silt, clay or peat and organic material*".
- Bielby Sand Member – identified in the far west of the Route Section and described as '*slightly clayey to slight silty sand with local fine-grained gravels…with thin beds of clayey sandy peat*'.

Route Section 3: A63 Dual Carriageway to River Ouse Crossing

2.2.3 Superficial deposits are indicated to be present across the majority of the 250 m study area in Route Section 3: A63 Dual Carriageway to River Ouse Crossing and are indicated to be variable including the following:

- Bielby Sand Member – described as '*slightly clayey to slight silty sand with local fine-grained gravels…with thin beds of clayey sandy peat*';
- Head Deposits – indicated locally within riverbeds and described as '*gravel, sand and clay … locally with lenses of silt, clay or peat and organic material*'.
- Breighton Sand Formation – described as '*slightly clayey sand to silty sand with a variably developed compressible peat to clayey sandy peat base*';
- Hemingbrough Glaciolacustrine Formation - described as '*laminated clays, silts and sands with rare dropstones*';
- alluvium – associated with the River Humber described as '*normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel*' and 'Warp' which is described as artificially induced alluvium.

Route Section 4: River Ouse crossing and Route Section 5: River Ouse Crossing to Luddington

2.2.4 Superficial deposits are indicated to be present across the entirety of the 250 m study area in Route Section 4: River Ouse crossing and Route Section 5: River Ouse crossing to Luddington and comprises alluvium associated with the River Humber described as '*normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel*'.

Route Section 6: Luddington to M180 Motorway

2.2.5 Superficial deposits are indicated to present across the majority of the 250 m study area in Route Section 6: Luddington to M180 motorway and predominantly comprises alluvium associated with the River Humber and River Trent, described as '*normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel*' and Warp which is described as artificially induced alluvium. The Sutton Sand Formation is also indicated to be present within discrete areas of the study area described as *"fine-grained silty sand"*. There are also discrete areas within the study area where Superficial deposits are indicated to be absent.

Route Section 7: M180 Motorway to Graizelound

2.2.6 Superficial deposits are indicated to be present within some of the study area and absent in other areas. Where indicated to be present the superficial deposits are variable, with the following strata indicated to be present in the study area:

- Till (Mid Pleistocene) –described as *'a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape'* commonly referred to as boulder clay;
- Sutton Sand Formation – limited to small outcrops throughout the Route Section, described as *'fine-grained silty sand';*
- Hemingbrough Glaciolacustrine Formation - described as '*laminated clays, silts and sands with rare dropstones';*
- Glaciofluvial deposits (Devensian) – limited to very small outcrops throughout the Route Section, described as *'sands and gravels';*

- alluvium – associated with the River Humber described as '*normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel*' and Warp which is described as artificially induced alluvium;
- peat – indicated to be present in the alluvium to limited extents; and is described as *'partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps';*
- Head Deposits – indicated locally within riverbeds and described as '*gravel, sand and clay … locally with lenses of silt, clay or peat and organic material*'.

Route Section 8: Graizelound to Chesterfield Canal, Route Section 9: Chesterfield Canal to A620 east of North Wheatley and Route Section 10: A620 east of North Wheatley to Fledborough

2.2.7 Superficial deposits are indicated to be absent within large parts of Route Section 8; Graizelound to Chesterfield Canal, Route Section 9: Chesterfield Canal to A620 east of North Wheatley and Route Section 10: A620 east of North Wheatley to Fledborough study area. Where indicated to be present however, the superficial deposits comprise the following:

- alluvium – associated with the River Humber described as '*normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel*';
- Sutton Sand Formation – limited to small outcrops throughout the Route Sections, described as *'fine-grained silty sand';*
- peat - described as *'partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps';*
- Glaciofluvial deposits (Devensian) – limited to very small outcrops throughout the Route Sections, described as *'sands and gravels';*
- Head Deposits – indicated locally within riverbeds and described as '*gravel, sand and clay … locally with lenses of silt, clay or peat and organic material*'.

Route Section 11: Fledborough to High Marnham

2.2.8 Superficial deposits are indicated to be absent in the entirety of the Route Section 11: Fledborough to High Marnham study area.

2.3 Published Geology – Bedrock Geology

Route Section 1: Creyke Beck to Skidby

2.3.1 The bedrock geology within Route Section 1: Creyke Beck to Skidby comprises the Burnham Chalk Formation described as *'white thinly-bedded chalk with common…flint bands; sporadic marl seams'.*

Route Section 2: Skidby to A63 Dual Carriageway

2.3.2 The bedrock geology within Route Section 2: Skidby to A63 Dual Carriageway generally comprises the Burnham Chalk Formation described as *'white thinly-bedded chalk with common…flint bands; sporadic marl seams*'. To the west of the Route section along the boundary with Route Section 3: A63 carriageway to River Ouse Crossing a number of chalk, sandstone and mudstone dominated strata is indicated to be present as follows:

- Welton Chalk Formation;
- Ferriby Chalk Formation;
- Hunstanton Formation – chalk;
- Ancholme Group – mudstone; and
- Brantingham Member – sandstone.

Route Section 3: A63 dual carriageway to River Ouse Crossing

2.3.3 The bedrock geology within Route Section 3: A63 dual carriageway to River Ouse Crossing generally comprises the Mercia Mudstone Group described as *'…mudstones and subordinate siltstone with thick halite-bearing units…thin beds of gypsum/anhydrite are widespread; thin sandstones are also present'.* To the east of the section along the boundary with Route Section 2: Skidby to A63 Dual Carriageway a number of chalk, limestone, sandstone and mudstone dominated strata is indicated to be present as follows:

- Kellaways Sand Member – sandstones and siltstones;
- Thorncroft Sand Member – sandstone, siltstone and mudstone;
- Upper Lincolnshire Limestone Member – ooidal limestone;
- Lower Lincolnshire Limestone Member – limestone;
- Kirton Cementstone Beds – mudstone and limestone;
- Whitby Mudstone Formation;
- Marlstone Rock Formation – ferruginous limestone and sandstone;
- Charmouth Mudstone Formation;
- Pecten Ironstone;
- Frodingham Ironstone;
- Scunthorpe Mudstone Formation – mudstone and limestone; and
- Penarth Group – mudstone.

Route Section 4: River Ouse crossing, Route Section 5: River Ouse Crossing to Luddington, Route Section 6: Luddington to M180 Motorway and Route Section 7: M180 Motorway to Graizelound

2.3.4 The bedrock geology within Route Sections 4 to 7 is indicated to comprises the Mercia Mudstone group described as *'…mudstones and subordinate siltstone with thick halite-bearing units…thin beds of gypsum/anhydrite are widespread; thin sandstones are also present'*.

Route Section 8: Graizelound to Chesterfield Canal, Route Section 9: Chesterfield Canal to A620 East of North Wheatley, Route Section 10: A620 East of North Wheatley to Fledborough and Route Section 11: Fledborough to High Marnham

2.3.5 The bedrock geology within Route Sections 8 to 11 is indicated to comprise predominately the Mercia Mudstone group described as *'…mudstones and subordinate siltstone with thick halite-bearing units…thin beds of gypsum/anhydrite are widespread; thin sandstones are also present'*. In small discrete areas the Clarborough Member is indicated to be present and is described as *'mudstones…with common veins of satin spar gypsum and indurated beds of reddish brown and greenish grey siltstone and very fine-grained dolomitic sandstone'*.

3. Methodology

3.1 Introduction

3.1.1 The assessment of land contamination within the draft Order Limits has been undertaken following a staged approach as recommended by the guidance provided in Land Contamination Risk Management (LCRM) (Ref 12.1.6). This presents a three-stage process to the management of contaminated land.

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

3.1.2 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.

3.1.3 This appendix provides a PRA (Tier 1) of ground conditions for the Project and identifies locations where there is the potential for significant sources of contamination. The result of the PRA forms the basis for the baseline conditions and assessment within **Chapter 12 Geology and Hydrogeology** and **Chapter 20 Substations and Associated Works**.

3.2 Preliminary Risk Assessment Methodology

Initial Assessment

3.2.1 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. 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.

3.2.2 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 3.1 – Criteria for classifying the potential for generating contamination, which has been developed using the guidance within LCRM (Ref 12.1.6).

Table 3.1 – Criteria for classifying the potential for generating contamination

Classification score	Potential for generating contamination
Very Low	Limited potential for generating contamination Land use examples: residential, retail or office use, agricultural.
Low	Some potential for generating contamination Land use examples: recent small scale industrial and light industry
Moderate	Some potential for generating contamination with possible widespread slightly elevated contamination levels and/or locally elevated concentrations Land use examples: railway yards, collieries, scrap yards, inert landfills
High	Potential for widespread elevated contamination Land use examples: heavy industry, non-hazardous landfills
Very High	Highest risk of elevated contamination being present, likely widespread elevated concentrations Land use examples: hazardous landfills, large gas works, chemical works

3.2.3 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 which could result in significant effects.

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

3.2.5 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.

3.2.6 The built environment as a receptor in relation to contaminated land (e.g. aggressive ground conditions and ground gas) is not considered further in this assessment on the basis of the commitments included within **Chapter 12 Geology and Hydrogeology** and the **Appendix 4.1 Outline Code of Construction Practice**.

Further Assessment

3.2.7 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.

3.2.8 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.

3.2.9 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.

3.2.10 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.

3.2.11 To determine the risk to the identified receptor, both the probability (Table 3.2 - Classification of probability) and the degree of harm to a potential receptor (Table 3.3 - Classification of consequence (combination of receptor sensitivity and potential for generating contamination) and Table 3.4 - Classification of consequence) are used and the risk estimated for each pollutant linkage using the matrix in Table 3.5 - Classification of risk, which is based on standard industry guidance provided within the Construction Industry Research and Information Association (CIRIA) report C552 (Ref 12.1.7). The risk classifications are defined in Table 3.6. Definitions of receptor sensitivity are provided in Table 12.3 of **Chapter 12 Geology and Hydrogeology**.

Table 3.2 - Classification of probability

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 3.3 - Classification of consequence (combination of receptor sensitivity and potential for generating contamination)

Potential for Generating Contamination	Receptor sensitivity				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Very High	Severe	Severe	Medium	Medium	Mild
High	Severe	Medium	Medium	Mild	Minor
Moderate	Medium	Medium	Mild	Mild	Minor
Low	Medium	Mild	Mild	Minor	Minor
Very Low	Mild	Minor	Minor	Minor	Minor

Table 3.4 - Classification of consequence

Classification	Examples
Severe	Human health effect – exposure likely to result in 'significant harm' as defined in the Defra (2012) Part 2A Statutory Guidance (Ref 12.1.8). Controlled water effect – short-term risk of pollution (note: Water Resources Act (Ref 12.1.9) 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 closure of potable abstraction point or loss of amenity, agriculture or commercial value. Major fish kill. Ecological effect – short-term exposure likely to result in a substantial adverse effect. Catastrophic damage to crops, buildings or property.
Medium	Human health effect – exposure could result in 'significant harm'. Controlled water effect – equivalent to Environment Agency Category 2 incident requiring notification of abstractor. Ecological effect – short-term exposure may result in a substantial adverse effect. Damage to crops, buildings or property.
Mild	Human health effect – exposure may result in 'significant harm'. Controlled water effect – equivalent to Environment Agency Category 3 incident (short lived and/or minimal effects on water quality). Ecological effect – unlikely to result in a substantial adverse effect. Minor damage to crops, buildings or property. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor	No measurable effect on humans. Protective equipment is not required during site works. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects to crops, buildings or property. The loss of plants in a landscaping scheme. Discolouration of concrete.

Table 3.5 - Classification of risk

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very High	High	Moderate	Low
	Likely	High	Moderat	Moderate	Low
	Low Likelihood	Moderate	Moderat	Low	Very low
	Unlikely	Low	Low	Very low	Very low

Table 3.6 - Risk Rating Definitions

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.

4. Preliminary Contamination Assessment

4.1 Initial Assessment

4.1.1 Much of the draft Order Limits 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. 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.

4.1.2 Multiple small discrete areas within the study area have also historically been used as chalk/clay/brick pits but they haven't been identified as a landfill or infilled, some of which are also noted to be filled with water. It is considered that there is generally a low risk of these sites to have a potential for generating, therefore, they have not been taken forward for further assessment, larger sites have been included in the tables below where relevant.

4.1.3 There are twelve sites/areas within the draft Order Limits, and a further twenty-three 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 4.1 to Table 4.7 with a corresponding Classification Score for their potential for generating contamination.

4.1.4 Sites with a potentially contaminative land use were not identified within Route Sections 1, 4, 7 9 of the draft Order Limits or study area; therefore, these do not have a table presented below.

Table 4.1 - Potential sources of contamination in Route Section 2 - Skidby to A63 Dual Crriageway

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S2-PSC1	Willerby Restoration Limited – landfill site	Albion Lane, Willerby, Nr Hull, Humberside (498497E, 433377N)	From the earliest reviewed mapping dated 1885-1900 the site is shown as a railway line within a cutting. The earliest reviewed Google aerial imagery, dated 2003, shows the railway line has been removed, and by the 2017 Google aerial imagery trees have started to be removed from the cutting sides. The 2019 imagery indicates the cutting to have been infilled. The site is identified as a historical landfill, permitted from 2007 to 2018 for inert material. 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
S2-PSC2	Sewage sludge disposal site	East of Rowley Road, Riplingham, 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
S2-PSC3	Raywell Road – historical landfill	Riplingham, Yorkshire. (496500E, 431700N)	The historical map dated 1888-1913 indicates the presence of a chalk pit within the location of the historical landfill. Environment Agency data set indicates 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 fields with no evidence of landfilling. The current land use, based on the most recent Google aerial imagery dated 2022, comprises open fields.	High
PSC within 250 m of the draft Order Limits				

PSC No	Name	Location	Description	Potential for generating contamination
S2-PSC4	Dunflat Lane – Historical Landfill	Dunflat Road, Risby, Yorkshire (500194E, 434568N)	From the earliest reviewed mapping dated 1855 the site is labelled as an old chalk pit. The site appears to remain largely unchanged, until the site is indicated by the Environment Agency data set as a historical landfill taking inert and industrial waste from 1948. However, the Environment Agency dataset indicates the site was exempt from a licence and no surrender date is shown. Google aerial imagery dated 2003 shows the site comprising hardstanding and material storage and remains largely unchanged until the 2019 imagery when a circular tank is shown on the site.	High
S2-PSC5	Walk Farm Site A – historical landfill	Little Weighton Cottingham, North Humberside (499100E, 433700N)	The 1888-1913 mapping shows the site as a chalk pit. Identified by the Environment Agency data set as a historical landfill that accepted inert and industrial waste (assumed to be non-hazardous at this time) between 1960 and 1980 (ref: EAHLD05025). The earliest reviewed Google aerial imagery, dated 2003, shows no evidence of the landfill/quarry and shows an area of fields in agricultural use. In 2007, however, whilst the rest of the field is in agricultural use (crops), the landfill area has not been utilised. The area remains out of agricultural use on the imagery dated 2019. The current land use, based on the most recent Google aerial imagery dated 2023 is agricultural across the whole field including the historical landfill area.	High
S2-PSC6	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 by the Environment Agency data set as a historical landfill that accepted inert and industrial waste 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
S2-PSC 7	Walk Farm Site C – historical landfill	Little Weighton Cottingham, North	Identified as a historical landfill by the Environment Agency data set that accepted inert and industrial waste between 1960 and 1990 (ref:	High

PSC No	Name	Location	Description	Potential for generating contamination
		Humberside (499700E, 432800N)	EAHLD05026). The current land use, based on the most recent Google aerial imagery dated 2022 comprises open fields.	
S2-PSC 8	Walk Farm Site D – historical landfill	Little Weighton Cottingham, North Humberside (499300E, 433000N)	The 1937-1961 mapping shows a circular pit structure. Identified by the Environment Agency data set 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
S2-PSC 9	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

Table 4.2 - Potential sources of contamination within Route Section 3 - A63 Dual Carriageway to River Ouse Crossing

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S3-PSC1	Land Adjacent to former A63 Ellerker – Borough Road and Stockbridge	Land Adjacent to former A63 Ellerker – Borough Road (492900E, 428900N)	The map dated 1888-1913 indicates that the northern part of the site is labelled as ‘old gravel pits’. The site is indicated to be split into two historical landfills based on the permit information available from the Environment Agency data set, 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	High

PSC No	Name	Location	Description	Potential for generating contamination
	Roundabout – historical landfill		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.	
S3-PSC2	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
S3-PSC3	London North Eastern railway line	Runs approximately north-west to south-east through the draft Order Limits through the village of Broomfleet	Identified 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 draft Order Limits.	Low
PSC within 250 m of the draft Order Limits				
S3-PSC4	Ellerker Pits landfill No.2	(493100E, 428500N)	The site is indicated on the earliest reviewed historical mapping dated 1888-1913 as a series of gravel pits. The site is indicated to be a historical landfill, based on the Environment Agency data set, that received inert waste from 1990 until 1994. By the Google aerial imagery dated 2003 the site is shown as a field in agricultural use and has been entirely restored.	Moderate
S3-PSC5	Blacksmith's row – general works	Blacksmith's row, Ellerker, HU15 2DH	Identified from the East Riding of Yorkshire Council dataset and currently comprises a row of cottages. Historical mapping dated 1885-1900 shows the	Low

PSC No	Name	Location	Description	Potential for generating contamination
		(492146E, 429371N)	village of Ellerker and a smithy is labelled at the location however by the mapping dated 1945-1965 this is no longer labelled.	
S3-PSC6	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 industrial style buildings in the northern part of the site 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 indications of its continued use as a depot.	Low
S3-PSC7	Coletta and Tyson – large scale crop growing and nursery	South Cave, Borough, HU15 2FJ (490920E, 429384N)	Currently a large-scale crop grower and nursery.	Low
S3-PSC8	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
S3-PSC9	Wienerberger - Current and historical brick and tile works, clay pits and tile factory	Broomfleet, 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 adjacent to the canal. Google Earth aerial imagery dated 2003 shows the factory seen in the 1952 photography as 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	Moderate around the factory buildings. Low in the mineral excavation areas as the restoration plan does not involve the

PSC No	Name	Location	Description	Potential for generating contamination
			2019 Google aerial imagery shows that further excavation has happened to the south-west and are filled with water.	import of potentially contaminated material.
S3-PSC10	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 include 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 with industrial buildings and an access road with no significant change noted since.	Low
S3-PSC11	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
S3-PSC12	Vehicle recovery/garage	Broad Lane, Staddlethorpe, DN14 7XT (484427E, 425561N)	The earliest reviewed mapping (1885-1900) indicates a building within the site, and there are no subsequent significant changes. The current use for vehicle recovery includes a building and associated hardstanding.	Low
S3-PSC13	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

Table 4.3 - Potential sources of contamination within Route Section 5 - River Ouse Crossing to Luddington

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S5-PSC1	Railway line – Fockerby Branch	Crosses the Order Limits 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 draft Order Limits 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 railway predominantly comprises trees and fields in agricultural use, which remain until the most recent aerial imagery reviewed.	Low
PSC within study area				
S5-PSC2	Luddington sewage treatment works	Carr Lane, Garthorpe and Fockerby, DT17 4AH (416839E, 416839N)	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 and remains largely unchanged through to the most recent aerial imagery dated 2024.	Low

Table 4.4 - Potential sources of contamination within Route Section 6 - Luddington to M180 motorway

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S6-PSC1	Former Keadby Power Station landfills	Station Road, Keadby, Scunthorpe, South Humberside (481300E, 411500N)	The site comprises a number of landfills associated with the former coal fuelled Keadby Power Station. The landfills were licenced to accept a variety of wastes include inert, industrial, commercial, household and special waste. The licences were issued between 1958 and 1987; however a surrender or last input date is not shown. The Google aerial imagery dated 2002 shows the entire area has been restored and comprises a mixture of fields in agricultural use and scrub/woodland.	High
S6-PSC2	Railway line, Trent Ancholm and Grimsby Line/Barnsley to Barnetby	479932E, 411074N	The railway line is shown on the reviewed mapping dated 1885-1900 and is present through to the present day.	Low
PSC within study area				
S6-PSC3	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
S6-PSC4	Keadby Power Station	Trentside, Keadby, Scunthorpe, DN17 3EF (482582E, 144705N)	An internet search has indicated that the coal fuelled power station was first constructed in 1948 and was later closed in 1984. A pair of natural gas-fired power stations were later built on the site in 1996. Construction on 'Keadby 2' commenced in 2018 and became operational in 2023.	Low, based on the likelihood that any contamination would have been remediated for the construction of the gas-fired power station.

Table 4.5 - Potential sources of contamination within Route Section 8 - Graizelound to Chesterfield Canal

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S8-PSC1	Railway Line	Great Northern and Eastern Joint railway. Runs approximately north-west to south-east through the Order Limits	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 mostly at-grade level throughout the draft Order Limits.	Low

Table 4.6 - Potential sources of contamination within Route Section 10 - A620 East of North Wheatley to Fledborough

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S10-PSC1	Railway line – Great Central Railway – Lincoln and Redford Branch	Two lines that enter the draft Order Limits from the west, and split into two lines heading	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

PSC No	Name	Location	Description	Potential for generating contamination
		north-east and south-east		
PSC within study area				
S10-PSC2	Former Sturton brickworks	Wheatley Road, Sturton Le Steeple, DN22 9DW (477851E, 384893N)	The earliest reviewed mapping dated 1885 indicates the site is a brick works, with workings to the north and buildings towards the centre of the site. The site remains largely unchanged through the map editions, but by the mapping dated 1920 the brick works is no longer labelled and the site is called The Poplars, which appears to be residential.	Low
S10-PSC3	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 along the eastern boundary and circular treatment tanks in the centre. The 2015 imagery indicates the northern part of the site has been redeveloped adding two further tanks. The site then remains largely unchanged through to the latest imagery.	Low

Table 4.7 - Potential sources of contamination within Route Section 11 - Fledborough to High Marnham

PSC No	Name	Location	Description	Potential for generating contamination
PSC within draft Order Limits				
S11-PSC1	Dismantled railway line	Running approximately east to west through the draft Order Limits	The railway first appeared on the historical map dated 1885-1900 and was later used to transport coal to High Marnham power station. The railway line was also 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
S11-PSC2	Former High Marnham Power Station and current electrical 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. 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.	High
PSC within study area				
S11-PSC3	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 is indicated to have been in 1979. The current land use, based on the most recent Google aerial imagery dated 2022 comprises an open aera of scrub land.	High

4.1.5 The initial assessment has identified twenty-one 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.

4.1.6 Fourteen sites have been identified with a moderate or above potential for generating contamination and these have been taken forward for further assessment. 5 of which are within the draft Order Limits and 9 which are within the study area.

4.2 Further Assessment

Route Section 2 – Skidby to A63 dual carriageway

S2-PSC1 – Willerby Restoration Limited – landfill site (inside of the draft Order Limits)

Site name/ref	S2-PSC1 – Willerby Restoration Limited – landfill site (inside of the draft Order Limits)
Site location and description	Albion Lane, Wilerby, Nr Hull, Humberside (498497E, 433377N) The site is a long narrow 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 also has a current environmental permit for inert material. The current permit was first issued in 2014 for a material recycling treatment facility (ref: BB3709MJ).
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 draft Order Limits 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 groundwater Source Protection Zone (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)	Medium	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, whilst the site is located within the draft Order Limits, ground disturbance within the site is not anticipated as the proposed pylon bases are located outside of the landfill boundary and significant below ground excavations associated with construction for the proposed haul road across the landfill area are unlikely.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill is not anticipated to contain significantly contaminative materials. In addition, whilst the site is located within the draft Order Limits, ground disturbance within the site is not anticipated as the proposed pylon bases are located outside of the landfill boundary and significant below ground excavations associated with construction for the proposed haul road across the landfill area are unlikely.	Low

S2-PSC3 – Raywell Road – historical landfill (Inside of the draft Order Limits)

Site name/ref	S2-PSC3 – Raywell Road – historical landfill (Inside of the draft Order Limits)
Site location and description	Raywell Road, Riplingham, 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. The site currently comprises open fields in agricultural use and is also surrounded by fields.
Site history	The map dated 1888-1913 indicates the presence of a chalk pit within the location of the subsequent historical landfillI which has been identified by the Environment Agency data. The Google aerial imagery dated 2003 shows the site in 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 superficial deposits are 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	Unlikely. The landfill accepted a variety of wastes, and therefore contaminated material is likely to be present; however, whilst the site is located within the draft Order Limits, ground disturbance within the site is not anticipated as the proposed pylon bases are located outside of the landfill boundary.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill accepted a variety of wastes, and therefore contaminated material is likely to be present; however, whilst the site is located within the draft Order Limits, ground disturbance within the site is not anticipated as the proposed pylon bases are located outside of the landfill boundary.	Low

S2-PSC4 – Dunflat Lane – historical landfill (adjacent to draft Order Limits)

Site name/ref	S2-PSC4 – Dunflat Lane – historical landfill (adjacent to draft Order Limits)
Site location and description	Dunflat Lane, Risby, Yorkshire (500194E,434568N). The site is located directly south of Dunflat Lane. The site is approximately 1.5 km east of Little Weighton. The site is located adjacent to the draft Order Limits however this part of the of the draft Order Limits is included for visibility splays for access, with no intrusive works being undertaken within the vicinity of the area. The nearest intrusive works will be approximately 350 m south of the site.
Site history	The earliest reviewed mapping dated 1855 shows the site labelled as an old chalk pit. By the mapping dated 1952 the site is no longer labelled as a chalk pit however the outline of the pit can still be seen. The Environment Agency historical landfills dataset indicates the site received inert and industrial waste from 1948 and was exempt from needing a licence. No surrender date is shown on within the dataset. The Google aerial imagery dated 2003 shows the site comprising hardstanding and being used for material storage, the site remains largely unchanged until the 2019 imagery when a circular tank is shown on the eastern half of the site.
Other pertinent information	Based on the information obtained from the Environment Agency data the historical landfill received waste from 1948 and received inert and industrial waste (ref: EAHLS05149).
Geology	The BGS Geoindex indicates that superficial deposits are indicated to be present comprising Till (Devensian), 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 and the Till is classified as a Secondary Undifferentiated Aquifer. The site is also located within a SPZ2, 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	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low

S2-PSC5 – Walk Farm Site A – historical landfill (approximately 130 m from draft Order Limits)

Site name/ref	S2-PSC5 – Walk Farm Site A – historical landfill (approximately 130 m from draft Order Limits)
Site location and description	Little Weighton Cottingham, North Humberside (499100E, 433700N). The site is located to the south of Litte Weighton Road within an area of trees in the middle of a field that is currently in agricultural use. Approximately 300 m south-east of Little Weighton. The site is surrounded by further fields.
Site history	The 1910 dated mapping shows the site as an old chalk pit. By the mapping dated 1928 the pit is no longer labelled. The earliest Google aerial imagery reviewed, dated 2003, shows no evidence of the landfill/quarry and shows a field.
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 1980. The site was licenced from 1977 until 1985 (ref: EAHLD5025).
Geology	The BGS Geoindex indicates that 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 SPZ2, 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	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low

S2-PSC6 – Walk Farm Site B – historical landfill (directly adjacent to draft Order Limits)

Site name/ref	S2-PSC6 – Walk Farm Site B – historical landfill (directly adjacent to draft Order Limits)
Site location and description	Little Weighton Cottingham, North Humberside (499800E, 433200N). The site is located to the north of Riplingham Road within an area of trees in 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.
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 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	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low

S2-PSC7 – Walk Farm Site C – historical landfill (approximately 50 m from the draft Order Limits)

Site name/ref	S2-PSC7 – Walk Farm Site C – historical landfill (approximately 50 m from the draft Order Limits)
Site location and description	Little Weighton Cottingham, North Humberside (499700E, 432800N). The site is located to the north of Riplingham Road within an 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 earliest reviewed mapping dated 1885 indicates the site is located within a field. The earliest Google aerial imagery reviewed, dated 2003, also 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 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	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low

S2-PSC8 – Walk Farm Site D – historical landfill (approximately 150 m from draft Order Limits)

Site name/ref	S2-PSC8 – Walk Farm Site D – historical landfill (approximately 150 m from draft Order Limits)
Site location and description	Little Weighton Cottingham, North Humberside (499300E, 433000N). The site is located to the north of Riplingham Road within an 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 at the location of the site. The earliest Google aerial imagery reviewed, dated 2003, shows the site as an area of trees and remains unchanged through to the 2024 aerial imagery.
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 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	Unlikely. The landfill accepted a variety of wastes; however, it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill accepted a variety of wastes; however; it is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low

Route Section 3 – A63 Dual Carriageway to River Ouse

S3-PSC1 – land adjacent to former A63 Ellerker – historical landfill (inside of draft Order Limits)

Site name/ref	S3-PSC1 – land adjacent to former A63 Ellerker – historical landfill (inside of draft Order Limits)
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 Environment Agency data set indicates the site first received waste in 1983 and that the licence was surrendered in 1994. The Google aerial imagery dated 2003 indicates the site had already been restored at that time.
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 covering the entire site (ref: EAHLD05031) was issued in 1983 and surrendered in 1994. The site received inert, industrial and commercial waste and is indicated to contain 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 superficial deposits are indicated to be absent from the majority of the site, with the exception of the Bielby Sand Member, 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	Unlikely. The landfill is located partially within the draft Order Limits, and although the site accepted a variety of wastes and is likely to be a source of potential contamination, ground disturbance is not anticipated within the site as the proposed pylon bases are located outside of the landfill boundary. An area within the landfill boundary has been proposed for potential environmental planting and/or enhancement. The details of the proposed planting are currently unknown and will be determined as the design evolves, however excavations into the landfill are not anticipated. An assessment of the proposed planting will be presented in the ES and will include any additional mitigation measures considered necessary	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill is located partially within the draft Order Limits, and although the site accepted a variety of wastes and is likely to be a source of potential contamination, ground disturbance is not anticipated within the site as the proposed pylon bases are located outside of the landfill boundary. An area within the landfill boundary has been proposed for potential environmental planting and/or enhancement. The details of the proposed planting are currently unknown and will be determined as the design involves, however excavations into the landfill are not anticipated. An assessment of the proposed planting will be presented in the ES and will include any additional mitigation measures considered necessary	Low

PSC 32 – Ellerker Pits Landfill No.2 – historical landfill (approximately 70 m from the draft Order Limits)

Site name/ref	PSC 32 – Ellerker Pits Landfill No.2 – historical landfill (approximately 70 m from the draft Order Limits)
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. The Environment Agency data set indicates the site was a licenced landfill that received waste between 1990 to 1994. By the Google aerial imagery reviewed dated 2003, the site is shown as land in agricultural use and appears to have 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 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 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	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)	Medium	Unlikely. The landfill is not anticipated to contain significantly contaminative materials and is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (high sensitivity)	Medium	Unlikely. The landfill is not anticipated to contain significantly contaminative materials and is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low

S3-PSC9 – Wienerberger - Current and historical brick and tile works, clay pits and tile factory (Broomfleet Tile Works) (Located directly adjacent to the draft Order Limits)

Site name/ref	S3-PSC9 – Wienerberger - Current and historical brick and tile works, clay pits and tile factory (Located directly adjacent to the draft Order Limits)
Site location and description	Tongue Lane, Broomfleet, 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 building with a number of chimneys adjacent to the canal. Google aerial imagery dated 2003 shows the building seen in the 1952 photography is no longer present and a different building 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 indicated to be present 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 around the factory buildings. Low in the mineral excavation areas.
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)	Medium	Unlikely. The Project includes proposals for a limited number of pylons, work areas and haul roads within areas of the brick and tile works that have already been or are proposed for mineral extraction. The Project is not anticipated to impact on the existing factory buildings.	Low
	Leaching Migration Deposition	Groundwater (medium/low sensitivity)	Mild	Unlikely. The Project includes proposals for a limited number of pylons, work areas and haul roads within areas of the brick and tile works that have already been or are proposed for mineral extraction. The Project is not anticipated to impact on the existing factory buildings.	Very low

Route Section 6 – Luddington to M180 Motorway

S6-PSC1 – Former Keadby Power Station landfills (Located within the draft Order Limits)

Site name/ref	S6-PSC1 – Former Keadby Power Station landfills (Located within the draft Order Limits)
Site location and description	Station Road, Keadby, Scunthorpe, South Humberside (481700E, 412000N and 481300E, 411500N). The site forms a total of 7 separate landfills identified by the Environment Agency data set and there also appears to have been further ground disturbance in areas outside of the identified landfills. The area is accessed from Chapel Lane and is located 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 site of the former 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 for gas fired power stations. The landfill sites are located to the west of the power stations. The Google aerial imagery dated 2002 indicates the sites have been restored.
Other pertinent information	Waste was first input into the landfill located in the northern part of the site in 1958; however, a last input or license surrender date is not available for this landfill (EAHLD31480). The landfill was licenced to take industrial waste The landfills in the centre of the site (EAHLD34414 and EAHLD34434) relate to PFS settlement lagoons and do not have any date associated with them. The landfill on the south-west part of the 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). The three smaller landfills grouped together on the southern part of the site were all licenced to take a variety of wastes including inert, industrial, commercial and household waste. The first input dates vary from 1958 to 1994 with the last inputs between 1990 to 1995. It is anticipated that these landfills received waste from the historical coal fired power stations.
Geology	The BGS Geoindex indicates that the superficial deposits indicated to be present 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.

Site name/ref	S6-PSC1 – Former Keadby Power Station landfills (Located within the draft Order Limits)
Environmental setting	None.
Potential for generating contamination	High.
Potential contaminants	Heavy metals, ash, clinker, PFA, hydrocarbons, PCBs, sulphates, 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	Unlikely. The site is located within the draft Order Limits; however, the work within this area is not anticipated to include significant below ground excavations/disturbance (e.g. reconductoring and temporary above ground diversion of existing infrastructure).	Low
	Leaching Migration Deposition	Groundwater (medium sensitivity)	Medium	Unlikely. The site is located within the draft Order Limits; however, the work within this area is not anticipated to include significant below ground excavations/disturbance (e.g. reconductoring and temporary above ground diversion of existing infrastructure).	Low

S6-PSC3 – Knapton's Landfill (located directly adjacent to the draft Order Limits)

Site name/ref	S6-PSC3 – Knapton's Landfill (located directly adjacent to the draft Order Limits)
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, with the Old River Don river indicated adjacent to the southern and eastern part of the site. The Environment Agency data set indicates a landfill was located on the site that received waste from 1978 to 1990. 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 indicated to be present 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)	Medium	Unlikely. The landfill is not anticipated to contain significantly contaminative materials and is also located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (medium sensitivity)	Mild	Unlikely. The landfill is not anticipated to contain significantly contaminative materials and is also located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Very low

Route Section 11 – Fledborough to High Marnham

S11-PSC2 – Former High Marnham Power Station and current substation

Site name/ref	S11-PSC2 – 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 hard standing 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 Geoindex indicates that superficial deposits are likely 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	Unlikely. The site is located outside of the draft Order Limits therefore intrusive work within the site is considered unlikely.;	Low
	Leaching Migration Deposition	Groundwater (Medium sensitivity)	Medium	Unlikely. The site is located outside of the draft Order Limits therefore intrusive work within the site is considered unlikely	Low

S11-PSC3 – High Marnham Power Station historical landfill (located directly adjacent to the draft Order Limits)

Site name/ref	S11-PSC3 – High Marnham Power Station historical landfill (located directly adjacent to the draft Order Limits)
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 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 superficial deposits are likely 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	Unlikely. The landfill accepted a variety of wastes however is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Low
	Leaching Migration Deposition	Groundwater (low sensitivity)	Mild	Unlikely. The landfill accepted a variety of wastes however is located outside of the draft Order Limits, and therefore ground disturbance at the site in relation to the Project is not anticipated.	Very Low

5. References

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