12 Archaeology and Cultural Heritage

Introduction

12.1 This chapter of the ES assesses the impact of the Proposed Gas Pipeline on archaeology and cultural heritage. The assessment identifies and evaluates heritage assets within the Proposed Route Corridor and a surrounding study area, and assesses how the Proposed Gas Pipeline may potentially impact these heritage assets.

12.2 This assessment identifies potential significant adverse effects and sets out proposed mitigation measures for avoiding or minimising negative impacts, as appropriate.

12.3 This chapter is supported by three documents as detailed below.

12.4 An archaeological desk-based assessment (DBA) undertaken by Wessex Archaeology (Technical Appendix 12.1: Archaeological Desk Based Assessment). The aim of the DBA was to collate the known archaeological and historical information relevant to the Stage 1 Assessment Corridor and a 1 km study area extending from it and to assess past and existing impacts on the historic environment resource.

12.5 A geophysical survey undertaken by Wessex Archaeology (Technical Appendix 12.2: Geophysical Survey) between 18th February-2014 and 14th April-2014, with an additional area surveyed on the 26th August 2014, totalling approximately 47 hectares. The aim of the survey was to establish the presence/absence, extent and character of detectable archaeological remains along the Proposed Route Corridor and Temporary Access areas which might be subject to significant ground disturbance.

12.6 An assessment of Light Detection and Ranging (LiDAR) data by Wessex Archaeology (Technical Appendix 12.3: Archaeological Assessment of LiDAR Data), which was used to create a detailed Digital Terrain Model (DTM) of the Proposed Route Corridor and Temporary Access areas. Through analysis of the DTM it is possible to identify archaeological features, including features barely perceptible to the human eye such as former river channels.

Legislation and Policy Context

12.7 There is national legislation and guidance relating to the protection of, and development on or near, important archaeological sites and historical buildings within planning regulations as defined under the provisions of the Town and Country Planning Act 1990. In addition, local authorities are responsible for the protection of the historic environment within the planning system.

National Legislation and Policy

12.8 There is a significant body of statute law dealing with the historic environment (primary legislation).

12.9 Scheduled Monuments and Areas of Archaeological Interest are afforded statutory protection under the Ancient Monuments and Archaeological Areas Act 1979 (as amended) and the consent of the Secretary of State (Department of Culture, Media and Sport), as advised by English Heritage (EH), is required for any works within a Scheduled area.

12.10 Works affecting Listed Buildings or structures and Conservation Areas are subject to additional planning controls administered by Local Planning Authorities (LPAs) under the Planning (Listed Buildings and Conservation Areas) Act 1990.

12.11 Overarching guidance on nationally significant energy projects is provided in National Policy Statement (NPS) EN-1. The key aspects of EN-1 relevant to this Chapter are outlined within Section 5.8, which describes appropriate assessment requirements.

12.12 Policy guidance on gas supply infrastructure is provided in NPS EN-4. There is no substantive guidance within EN-4 which specifically relates to archaeology and cultural heritage.

12.13 Hedgerows are afforded protection by the Hedgerow Regulations 1997 (amended 2002). Hedgerows are deemed to be important if they are either associated with a Scheduled Monument, a site recorded in the Historic Environment Record, form an integral part of a field system or mark a parish boundary. In practice, this means that hedgerows shown on appropriate pre-1845 historic maps are considered ‘Important’ in planning terms.

12.14 The principal national guidance on the importance, management and safeguarding of the historic environment resource within the planning process is National Planning Policy Framework (NPPF) Section 12: Conserving and Enhancing the Historic Environment. The aim of the NPPF Section 12 is to ensure that Regional Planning Bodies, LPAs, developers and owners of heritage assets, adopt a consistent and holistic approach to conserving the historic environment. The key requirements are summarised below.

12.15 Applicants are required to provide proportionate information on the significance of designated and non-designated heritage assets affected by the proposals and an impact assessment of the proposed development on that significance. This should be...
in the form of a desk-based assessment and, where necessary, a field evaluation (NPPF 128).

12.16 LPAs are required to take into account the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation; the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring; the desirability of new development making a positive contribution to local character and distinctiveness; and opportunities to draw on the contribution made by the historic environment to the character of a place (NPPF 126/131).

12.17 In determining planning applications, great weight should be given to the conservation of designated heritage assets – World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas designated under the relevant legislation (NPPF 132).

12.18 In weighing applications that affect directly or indirectly the significance of a non-designated heritage asset, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset (NPPF 135).

12.19 LPAs should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner appropriate to their importance and the impact, and to make this evidence publicly accessible and any archives deposited with a local museum or other public depository (NPPF 141).

12.20 The national Planning Practice Guidance (PPG) provides a web-based resource in support of the NPPF. Following its launch, a number of previously published planning guidance documents have been cancelled and are detailed within the Written Ministerial Statement titled ‘Making the planning system work more efficiently and effectively’, dated 6th March 2014.

12.21 The PPG provides guidance on assessing and protecting heritage assets.

Regional Policy

12.22 The Yorkshire and Humber Regional Spatial Strategy was abolished in February 2013 and no longer forms part of the development plans for Doncaster Metropolitan Borough, East Riding of Yorkshire and Selby District.

Local Policy

12.23 The Proposed Gas Pipeline is situated across three separate administrative areas: Doncaster Metropolitan Borough, East Riding of Yorkshire and Selby District. Specific policies relating of the Doncaster Core Strategy Development Plan 2012, East Riding of Yorkshire Local Plan 1997 (Saved Policies), East Riding of Yorkshire Draft Strategy, Selby District Local Plan 2005 (Saved Policies) and Selby District Draft Core Strategy, relate to the historic environment (see Technical Appendix 12.1 for details). These policies aim to protect archaeological remains (both designated and non-designated), Listed Buildings and ancient woodland.

Issues Identified During EIA Scoping

12.24 The Proposed Gas Pipeline is situated across three separate administrative areas: Doncaster Metropolitan Borough, East Riding of Yorkshire and Selby District. The EIA Scoping Report was issued to key consultees, including DMBC, SDC and ERYC, setting out the proposed scope of, and approach to, the assessment of impacts (refer to Chapter 2 EIA Process). Relevant comments on the proposed scope are summarised below, together with an indication of where and how the comments are addressed in the ES. The assessment of these impacts has been carried out in accordance with the approach set out in the EIA Scoping Report, amended to reflect the comments set out in Table 12.1.

<table>
<thead>
<tr>
<th>Consultee</th>
<th>Issue</th>
<th>Where/How this is addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoS confirmed that the scope and assessment methodology for the Archaeology and Cultural Heritage assessment was considered largely acceptable. However the following was noted as additional advice:</td>
<td>The ES Chapter includes all details of survey work undertaken in support of the assessment.</td>
<td></td>
</tr>
<tr>
<td>All surveys should be completed prior to DCO application to inform the assessment of effects within the ES. Consideration should be given to the potential effects on cultural heritage resources including historic buildings, landscapes and archaeological sites.</td>
<td>As outlined within the Statutory and local heritage designations section, the Humberhead NIA is not considered to have any impact on the archaeological and cultural heritage assessment.</td>
<td></td>
</tr>
<tr>
<td>Assessment should be undertaken of the potential impacts on nationally and locally designated sites including the Humberhead NIA.</td>
<td>The Potential Effects section of this Chapter includes consideration of cultural heritage.</td>
<td></td>
</tr>
<tr>
<td>The ES should include an</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
assessments of the potential for glacial and alluvial deposits to contain archaeological evidence.
- Assessment should be undertaken of the potential impacts upon heritage sites.
- Consideration should be given to available Lidar data.
- Consideration should be given to the Scheduled Monument at Fenwick Hall which is within the 500m buffer area of the proposed pipeline.

North Yorkshire County Council
- The NYCC indicated that the North Yorkshire Historic Environment Record should be consulted as part of the Desk Based Assessment.
- In addition a geophysical survey should be undertaken over the proposed route.

Kirk Sandall Parish Council
- The ES should include an Archaeological Impact Assessment to identify the potential impacts of development on sub-surface features/structures.

Addressed within Appendices 12.1 and 12.2.

12.25 Additional comments from consultees regarding archaeology and cultural heritage were received during Stage 1 and Stage 2 consultation (refer to the Consultation Report for further details). These additional comments have been assessed and considered in this chapter and reflected in updated mitigation sections where appropriate.

Assessment Methodology

Baseline Characterisation

12.26 The recorded historic environment resource within a 1 km study area around the Proposed Route Corridor was considered in order to provide a context for the discussion and interpretation of the known and potential resources associated with the Proposed Development.

12.27 A number of publicly accessible sources of primary and synthesised information were consulted; these are detailed in full in Technical Appendix 12.1.

12.28 A walkover survey to inform the baseline was carried out by Wessex Archaeology between 2nd – September and 6th-September-2013. The aim of the visit was to assess the general aspect, character, condition and setting of the Proposed Gas Pipeline and to identify any potential impacts not evident from secondary sources.

Method of Assessment

12.29 The assessment of the significance of a site sets out to identify how particular parts of a place and different periods in its evolution contribute to, or detract from, identified heritage values associated with the site. This approach considers the present character of the site based on the chronological sequence of events that produced it and allows management strategies that sustain and enhance the significance of heritage assets to be developed.

Significance Criteria

12.30 Significance (for heritage policy) is defined in NPPF Annex 2 as:

‘the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting.’

12.31 The effects of the Proposed Gas Pipeline on the historic environment are assessed through consideration of the relative importance of the individual elements of the historic environment resource and how these are likely to be affected. A three step process is followed, involving assessments of the relative importance of the resource, the likely magnitude of impact on the resource and the significance of the effect on the resource.

Importance of the Resource

12.32 The importance of the known heritage assets has been assessed with reference to the Secretary of State’s non-statutory criteria for the Scheduling of Ancient Monuments, as modified by English Heritage. The criteria for assessing heritage assets are:
- Extent of survival
- Current condition
- Rarity
- Representativity, either through diversity or because of one important attribute
- Importance of the period to which with monument dates
- Fragility
12.33 These criteria are applicable to the assessment of all sites, whether Scheduled or not. The value of heritage assets is defined using the criteria presented in Table 12.2, with equivalent ratings of significance as used within Technical Appendix 12.1.

### Table 12.2 Criteria for Grading the Value of Heritage Assets

<table>
<thead>
<tr>
<th>Value</th>
<th>Archaeology</th>
<th>Built Heritage</th>
<th>Historic Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very High</strong></td>
<td>World Heritage Sites inscribed for their archaeological or built heritage qualities. Sites of international importance.</td>
<td>Standing remains inscribed as of universal importance as World Heritage Sites. Other buildings of recognised international importance.</td>
<td>World Heritage Sites inscribed for their historic landscape qualities. Historic landscapes of international importance.</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>Scheduled Monuments or monuments in the process of being Scheduled. Undesignated sites and monuments of schedulable quality and importance. Previously unknown sites of schedulable quality and importance, discovered in the course of evaluation or mitigation (i.e. sites of demonstrable national importance).</td>
<td>Grade I and II* Listed Buildings. Other Listed Buildings that can be shown to have exceptional qualities in their fabric or historical association not adequately reflected in the Listing. Registered Historic Parks and Gardens Grades I and II* Conservation Areas containing Very Important buildings</td>
<td>Designated historic landscapes of outstanding interest. Undesignated landscapes of outstanding interest. Undesignated landscapes of high quality and importance, and of demonstrable national importance.</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Local Authority designated heritage sites. Previously unknown and undesignated sites that would justify Local Authority designation (i.e. sites of regional importance). Sites with specific and substantial importance to the local community.</td>
<td>Grade II Listed Buildings, Registered Historic Parks and Gardens Grade II. Historic buildings that can be shown to have exceptional qualities or historical association. Conservation Areas, Historic townscapes or built-up areas with historic integrity in their buildings, or built setting.</td>
<td>Designated special historic landscapes. Undesignated historic landscapes that would justify special historic landscape designation. Landscapes of regional importance. Historic landscapes with specific and substantial importance to the wider community.</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>Undesignated sites of local importance. Sites</td>
<td>'Locally Listed' Buildings. Historic (unlisted)</td>
<td>Undesignated historic landscapes of local</td>
</tr>
</tbody>
</table>

12.34 Professional judgement is applied in considering these criteria to determine the importance of the resource, especially where features have no current national or local designation. The importance of the individual elements of the historic environment resource is valued on a 5-point scale: **Very High**, **High**, **Medium**, **Low**, and **Negligible**.
Magnitude of Impact

12.35 The assessment of the magnitude of impact is the identification of the degree of the effect of the Proposed Gas Pipeline upon elements of the historic environment. There is no standard scale of comparison against which the severity of effects on heritage assets may be judged, because of the great variety of resources and receptors. The assignment of a magnitude of impact is a matter of professional judgement. The assessment takes account of the construction and operational requirements, both of which may have permanent or temporary effects. Potential effects for each of these elements have been identified, whether direct or indirect. Effects may be adverse, neutral or beneficial.

12.36 Direct impacts are permanent, as the loss of or damage to heritage assets cannot be repaired, replaced or recreated. For the purpose of this assessment, archaeological, built heritage and historic landscape features that fall within the footprint of the Proposed Gas Pipeline are viewed as being subject to direct effect. The assessment of indirect effects is concerned with the effects of the construction and operational phases of the Proposed Gas Pipeline other than direct physical effect.

12.37 The magnitude of impacts (summation of direct and indirect impacts) on heritage assets has been assigned a value of High, Medium, Low, Negligible or No Change, as shown in Table 12.3.

<table>
<thead>
<tr>
<th>Value of Heritage Assets</th>
<th>Magnitude of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Major/Adverse</td>
</tr>
<tr>
<td>Medium</td>
<td>Moderate/Minor/Adverse</td>
</tr>
<tr>
<td>Low</td>
<td>Minor/Negligible Adverse</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>No Change</td>
<td>No Impact</td>
</tr>
</tbody>
</table>

Table 12.3 Criteria for Assessing Magnitude of Impact

<table>
<thead>
<tr>
<th>Value</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Complete destruction of a site, feature, or structure. Change to most or all key archaeological materials, or key building elements, such that the resource is totally altered. Comprehensive changes to setting.</td>
</tr>
<tr>
<td>Medium</td>
<td>A fundamental change or appreciable difference to the existing environment. Changes to many key archaeological materials or key historic building elements, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset.</td>
</tr>
<tr>
<td>Low</td>
<td>A minor change to the site or feature. Changes to the key archaeological materials or key historic building elements, such that the asset is slightly altered. Slight changes to setting. Limited changes to historic townscape character.</td>
</tr>
<tr>
<td>Negligible</td>
<td>Very minor changes to archaeological materials, building elements, or setting.</td>
</tr>
<tr>
<td>No Change</td>
<td>No change to the heritage asset or its setting.</td>
</tr>
</tbody>
</table>

Determination of Significance of Effect

12.38 The significance of effect has been derived from a consideration of the importance/potential of the resource and the degree of impact upon it as a result of the Proposed Gas Pipeline. This is illustrated in the Significance Matrix presented in Table 12.4.

<table>
<thead>
<tr>
<th>Value of Heritage Assets</th>
<th>Magnitude of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Major Adverse</td>
</tr>
<tr>
<td>Medium</td>
<td>Major Adverse</td>
</tr>
<tr>
<td>Low</td>
<td>Major/Moderate Adverse</td>
</tr>
<tr>
<td>Negligible</td>
<td>Minor/Negligible Adverse</td>
</tr>
<tr>
<td>Unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Table 12.4 Significance Matrix

Baseline Conditions

12.41 A detailed assessment of the historic environment relating to the Proposed Gas Pipeline within a 1 km study area from the Stage 1 Assessment Corridor is provided in Technical Appendix 12.1. The baseline conditions are summarised here.
Current Baseline

Previous Studies

12.42 Within South and East Yorkshire there are no recorded intrusive archaeological interventions within the Stage 1 Assessment Corridor. The northern end of the Proposed Route Corridor is crossed by a number of other pipelines, including the East Coast High Pressure Gas Pipeline, the Asselby to Pannel Pipeline and the Ryther to Scunthorpe Gas Pipeline.

12.43 All pipelines were subject to desk-based reports while the Asselby to Pannel Pipeline also saw a number of non-intrusive and intrusive archaeological investigations.

12.44 A watching brief was carried out along the Asselby to Pannel Pipeline where it crosses the Stage 1 Assessment Corridor and study area; however, no archaeological remains of significance which warranted further analysis were recorded within this area.

12.45 Within the study area, a number of intrusive and non-intrusive archaeological investigations have taken place in advance of development and for research purposes. Geophysical survey carried out at Topham Farm, Sykehouse, 200 m east of the Proposed Route Corridor revealed a herringbone pattern of drains feeding into a central spinal drain. The strength of the magnetic response from these drains masked the presence of archaeological remains at this site, which were only revealed following the excavation of trial trenches.

Statutory and local heritage designations

12.46 There are four designated heritage assets within the Stage 1 Assessment Corridor. Fenwick Hall moated site is a Scheduled Monument located 1 km to the east of Fenwick village (WA63). There are three Grade II Listed Buildings within the Stage 1 Assessment Corridor, all associated with the development of Fenwick Hall (WA119): the barn and attached outbuildings (WA114), the shelter shed and attached loose box (WA115). These buildings are located within Fenwick moated site Scheduled Monument, though they are of a later date than the scheduled remains, largely dating to the early 19th century.

12.47 There are two additional Scheduled Monuments located within the study area, Thorpe in Balne moated site and fishponds located 470 m east of the Stage 1 Assessment Corridor (WA61) and a medieval cross in the churchyard of the Holy Trinity Church (WA67), Sykehouse, 930 m south of the Stage 1 Assessment Corridor.

12.48 A total of 38 Listed Buildings are recorded within the study area. A concentration of 20 Listed Buildings are located within Snaith Conservation Area, at the northern end of the study area. These include one Grade I building (Church of St Lawrence) and nineteen Grade II Buildings, all located more than 800 m east of the Stage 1 Assessment Corridor.

12.49 The remainder of the Listed Buildings within the study area are Grade II, with the exception of the remains of a chapel at Manor House Farm, Thorpe in Balne which is Grade II* (WA62). The majority of these Listed Buildings, not including those in Snaith, comprise farmhouses and associated buildings.

National and local ecological designations

12.50 The Proposed Route Corridor does not pass through any nationally or locally designated ecological sites.

Archaeological and historical context

Prehistoric

12.51 The earliest indication of human activity within the study area comprises several scattered finds of Neolithic flints, recovered at Barnby Dun (WA1), at the southern end of the study area, on the eastern bank of the River Don, with further finds at Old Ings, Sykehouse (WA2), 120 m east of the Stage 1 Assessment Corridor, on the banks of the River Went. Prehistoric flints were also recovered within the Stage 1 Assessment Corridor north of the River Went (WA33 at D27.0), with others outside the Stage 1 Assessment Corridor, south of Gowdall (WA3) and the River Aire. These locations, along the banks of the Rivers Don and Went, is consistent with the general distribution pattern of earlier prehistoric findspots within the wider landscape, which appears to indicate that activity during this period was concentrated at the edges of watercourses.

12.52 It is thought that the River Aire would have provided a major wetland resource during the Mesolithic and Neolithic periods, as would the other river systems in the area. From work carried out by the Humber Wetland Survey (1997), assemblages of lithics recovered seem to suggest that the major wetland areas of the Levels were exploited at limited times during the year and that more permanent domestic sites were likely situated on higher and drier land.

12.53 Evidence for activity during the Bronze Age is limited to an arrowhead (WA4) recovered from Barnby Dun, at the southern end of the study area, in close proximity to Neolithic finds.

12.54 The topography of the Stage 1 Assessment Corridor is very uniform, being flat throughout with little variation. The Snaith Ridge, at the northern end, is slightly higher than the surrounding land and may have been a preferred site for settlement during the prehistoric period.

Iron Age and Romano-British

12.55 Evidence for activity during the Iron Age is more prolific than during previous prehistoric periods, with the Stage 1 Assessment Corridor and study area containing evidence for settlement and agricultural activity during this time. The Stage 1 Assessment Corridor and the study area are located within areas mapped by the National Mapping Programme (NMP), both of which have identified Iron Age and Romano-British remains within the study area. The wider landscape, particularly to the west, along the Magnesian Limestone ridge, can be seen to have been extensively occupied and farmed during these periods. While the evidence for similar activity is
less prolific within the Study Area, this is likely due to a change in geology and consequent reduction in visibility of cropmark remains, rather than an absence of settlement and activity.

12.56 Within the Stage 1 Assessment Corridor are the potential remains of an Iron Age/Romano-British enclosure to the west of Trumfleet (WA6), with a further enclosure of similar date recorded at Moss (WA5), 460 m west of the Stage 1 Assessment Corridor. A cropmark enclosure is also recorded within the Stage 1 Assessment Corridor, 500 m north of that at Trumfleet (WA125). Although undated, it may represent an Iron Age/Romano-British enclosure given the locations of similar sites in the immediate area. Cropmarks recorded by the Magnesian Limestone NMP include linear features within the Stage 1 Assessment Corridor to the west of Topham Ferry Farm (WA16), with further linear, rectangular enclosures and partial circular feature located just outside the Stage 1 Assessment Corridor.

12.57 An Iron Age and Romano-British settlement enclosure (WA7) was excavated in advance of drainage works at Topham Farm, 300 m east of the Stage 1 Assessment Corridor. This site revealed evidence for settlement dating from the 1st century BC to the early 3rd century AD. Nine circular structures were excavated and these are thought to have been part of a larger settlement which may have extended north, east, and, possibly, west. Cropmark remains identified partially within the Stage 1 Assessment Corridor (WA16 at D30.0 and WA130 at D27.0), located northwest of the Topham Farm settlement, may be of a similar date.

12.58 North of Pollington, 420 m west of the Stage 1 Assessment Corridor, are the extensive remains of an Iron Age/Romano-British settlement and associated field systems (WA19). These features have been identified from aerial photographs and consist of a group of rectilinear ditched enclosures containing a round house. Overlapping ditches in parts of the area suggests there is more than one phase of occupation at this site. To the east of these features, within the Stage 1 Assessment Corridor, is a potential Iron Age/Romano-British rectangular enclosure (WA23).

12.59 The Magnesian Limestone NMP and Vale of York NMP record further sites of potential Iron Age to Romano-British date throughout the study area. As with the other recorded cropmark features, these consist of linear boundaries and rectangular enclosures and are largely consistent with the morphology of known Iron Age and Romano-British features in the surrounding landscape, particularly to the west, along the Magnesian Limestone ridge. At the very northern end of the Proposed Gas Pipeline sections of such remains extend into the Stage 1 Assessment Corridor (WA30).

12.60 Roman pottery has been recovered from Fenwick, 300 m west of the Stage 1 Assessment Corridor. Further Roman finds and sites have been identified further north, with three beehive querns of Roman date found to the east of Balne Hall. A Romano-British burial and coins, together with further coins and a jetton were recovered from Snaith.

12.61 No evidence for the known Iron Age and Romano-British heritage assets were identified during the walkover survey. All sites were identified from aerial photographs and as such, would consist of below ground remains.

12.62 Physical evidence dating to the Anglo-Saxon period is rare within the study area and the wider landscape, with the only evidence coming from a bronze strip of possible Saxon date, recovered from Thorpe in Balne, 650 m east of the Stage 1 Assessment Corridor.

12.63 Place name evidence is the clearest indicator of activity within the study area during this time with a number of place names having Old English origin, including Fenwick, Sykehouse and Carlton. Other place names within the study area have Scandinavian origins, including Thorpe in Balne and Snaith.

12.64 Evidence for medieval occupation and activity is much more widespread within the study area than that from preceding periods. A Scheduled moated site is located within the Stage 1 Assessment Corridor, 1 km east of Fenwick (WA63). It is one of a close knit group in the Fenwick region, with other moated sites recorded within the study area at Thorpe in Balne, Balne Hall and Pollington. The Stage 1 Assessment Corridor was most likely used for agricultural purposes throughout the medieval period, associated with medieval settlements throughout the Study Area including Thorpe in Balne, Moss, Trumfleet, Fenwick, Sykehouse, Pollington, Snaith and Carlton. No evidence for other medieval industry has been identified within the Stage 1 Assessment Corridor or the study area.

12.65 Potential medieval remains associated with Fenwick moated site were identified during the walkover survey. Directly to the northeast of the moated site earthwork features of unknown function were identified. These features are located outside the Scheduled area; however, they may be associated with the medieval site and could potentially represent settlement remains. Ridge and furrow was identified northeast of Fenwick Hall, these are well preserved with ridges measuring approximately 2.5m wide and furrows 1.5m wide. They have the distinctive reverse ‘S’ shape which indicate they are potentially of medieval date. Further ridge and furrow was identified south of Fenwick Hall, though these are less well preserved than those identified to the northeast.

12.66 The most important developments within the Stage 1 Assessment Corridor, the study area and the surrounding landscape during the post-medieval period was the implementation of an extensive drainage scheme which largely succeeded in transforming the Humberhead Levels from marshes and fens to cultivable arable farmland. Prior to the implementation of drainage schemes across the Humberhead Levels, the landscape was often flooded, with rich grazing provided in drier months.
12.67 In the early 17th century a Dutch engineer, Cornelius Vermuyden, was engaged to drain Hatfield Chase, an area of 70,000 acres to the east of the Study Area. Between the years of 1626 and 1629, Vermuyden and his team drastically altered the landscape of the Humberhead Levels. Through Vermuyden’s schemes, the south channel of the Don was blocked to prevent it draining into pools, and all water was forced to flow to the northern branch, which flowed in to the Aire. This increased water flow to the northern branch of the Don had disastrous results for the surrounding landscape, with much of it being inundated by excess waters. Fishlake, to the east of the study area, and Sykehouse, within the study area, were both severely affected by the increased flooding. The solution to this problem of flooding within the northern end of the study area was to dig the ‘Dutch River’, located 2.5 km east of the study area, to take water directly to the River Ouse.

12.68 Historic maps from the late 18th century onwards were consulted during the preparation of the assessment. A number of hedgerows and drains along the Stage 1 Assessment Corridor were identified on these maps and still remain in use today. As such, these hedgerows are considered historically ‘Important’ as defined by the Hedgerows Regulations, and are therefore afforded statutory protection.

12.69 Late 18th century maps of the Proposed Route Corridor and the study area show that the landscape had been entirely enclosed by this time. Field patterns in some areas, particularly close to settlements such as Thorpe in Balne, Fenwick and Snaint, are reminiscent of medieval strip fields. The post-medieval and 19th century drainage features can be seen on 18th and 19th century maps and many of these drains are still in use today.

12.70 Historic maps show infrastructural developments within the Stage 1 Assessment Corridor and its surroundings, including the construction of the Great Northern and Manchester, Sheffield and Lincolnshire railway, the Gowdall and Braithwell railway line, the Hull, Babsley and West Riding Junction Railway and the Knottingly and Goole Canal.

12.71 Modern developments within the Stage 1 Assessment Corridor include the construction of Thorpe Marsh Power Station in the 1959.

12.72 A meandering channel has been identified incised through the Snaint ridge southeast of Gowdall, which flows into the Aire. This channel contains peat in excess of 1.2 m thick. Boreholes excavated along the floodplain of the River Aire during the Humber Wetlands Project revealed extensive peat development flanking the southern margins of this river. These peat deposits have the potential to preserve archaeological remains. Their subsequent burial and protection by alluvium and anthropogenic warp deposits of up to 2.78 m in depth, resulting from land improvements, indicate considerable potential for the preservation of archaeological remains.

12.73 Prehistoric and historic alluviation phases, coupled with historic warping practices have resulted in the masking of archaeological sites within the Humberhead Levels. Boreholes excavated to the south of the River Aire at Snaint Ings, East Cowick to the east of the study area revealed deposits of plough soil and subsoil over alluvium, peat and alluvium. Palynological evidence indicates the peat formation in this area occurred sometime after 4000BC, indicating either a Neolithic or Bronze Age date for the onset of peat formation. These peats are overlain by 1-2 m of alluvium.

12.74 Much of the Stage 1 Assessment Corridor is characterised as piecemeal enclosure 1540-2006, with fragmentary legibility of former open fields. Patches of agglomerated fields 1983-2006 are also located within the Stage 1 Assessment Corridor, with no historic legibility of former characters of assarts 1540-1982 and wet woodland 1066-1539.

12.75 North of the River Went, in North Yorkshire, the fieldscape is dominated by piecemeal enclosure. This area is an area of early enclosure on Balne Moor, possibly dating to the late medieval/early post-medieval period. It is characterised by erratic drainage ditches enclosing medium sized fields.

12.76 The historic landscape within the Stage 1 Assessment Corridor with its surroundings located within East Yorkshire has broadly similar landscape characterisation as that to the south. Drained wetlands gave way to piecemeal enclosure in the post-medieval period, with some fragmentary legibility of former open fields.

12.77 North of the River Aire, the landscape is dominated by modern improved fields dating to the 20th century. It consists of large irregular fields defined by erratic drainage ditches. Between this area and the River is an area characterised as planned large scale parliamentary enclosure, a result of the late 18th century enclosure and drainage. Fields are defined by drainage ditches, these, however are straighter than other drainage ditches in the wider area.

12.78 A detailed assessment of the results from the geophysical survey carried out along the Proposed Route Corridor and areas potentially subject to ground disturbance within the Application Area, along with appropriate figures and anomaly reference numbers, is provided in Technical Appendix 12.2. The survey included access routes and the Site Office / Pipe Dumpclose to the village of Burn. Most of the land at Burn had previously been disturbed leaving only a small area available for surveying.

12.79 The interpretation of potential archaeological features taken from the geophysical survey are presented here (see also Appendix 12.2), the most prominent concentrations of which are summarised below.

12.80 At the southern end of the Proposed Route Corridor a linear and L-Shaped anomaly (to the east of Thorpe Marsh drain) likely comprises an enclosure (Figure 3 within
Further anomalies interpreted as a double ditch are situated approximately 35m to the north of the likely enclosure.

12.81 A probable ring ditch, roundhouse or barrow is located approximately 550m northeast of the Scheduled Monument at Fenwick Hall, bounded on either side by several ditches (Figure 30 within Appendix 12.2).

12.82 An anomaly consisting of a probable pit with a surrounding spread of increased response (to the north of the River Went) is located close to a probable pair of ditches surrounded by a further area of spread of increased response, approximately 350m north of Topham near the centre of the Proposed Route Corridor (Figure 39 within Appendix 12.2).

12.83 Other anomalies within the survey area of the geophysical survey area have been identified as areas of ridge and furrow, possible or probable pits, ditches and former field boundaries. These anomalies are spread across the length of the Proposed Route Corridor and not concentrated together. The area surveyed at Burn produced several anomalies likely to represent concentrations of relatively modern magnetic debris. Further details and locations are provided within Technical Appendix 12.2. Additional anomalies identified comprise modern services, field drains and areas of ferrous material likely caused by modern debris.

**LiDAR Assessment**

12.84 A detailed assessment of the results obtained from analysis of the LiDAR Data along the Application Area, along with appropriate figures and anomaly reference numbers, is provided in Technical Appendix 12.3.

12.85 The interpretation of potential archaeological features taken from the LiDAR survey are summarised and presented here (see also Appendix 12.3).

12.86 In total, the LiDAR survey identified 66 anomalies within the Proposed Route Corridor. A large number of these anomalies, 24, relate to earthworks which reflect previous agricultural practice, either in the form of former field boundaries or areas of ridge and furrow ploughing. These are present throughout the Proposed Route Corridor with the ridge and furrow earthworks generally found within the southern half (Figures 3-5 within Appendix 12.3).

12.87 Seven large cut features have been identified within the Proposed Route Corridor which have been interpreted as representing potential palaeochannels. These are found between Buck Pit Bank to the north and Fenwick Hall to the south (Figures 5-7 within Appendix 12.3).

12.88 At the southern end of the Proposed Route Corridor, adjacent to Thorpe Marsh Drain and Engine Dike, lie the remains of a possible structure and associated enclosure (Figure 3 within Appendix 12.3). The enclosure extends approximately 15m east of the structure and encompasses its southern limit. A series of linear anomalies have been identified within Kerrick Spring Wood at the northern end of the Proposed Route Corridor (Figure 8 within Appendix 12.3). The anomalies appear to be inter-related but do not extend beyond the boundaries of the current woodland, and as such it is not clear whether they represent earlier sub-divisions or woodland management features.

12.89 A small group of possible mounds are located to the north of Park Gate Farm which appear immediately south of a probable former field boundary (Figure 5 within Appendix 12.3). A clear interpretation of these mounds is difficult, although the LiDAR Assessment concludes they are likely to represent fairly modern ground disturbance.

**Value of Heritage Assets**

12.90 For the purposes of this assessment, the sensitivity of the receptors has been formulated with reference to the value/significance of heritage assets, as set out in Tables 12.2 and 12.5.

12.91 There are no heritage assets within the Proposed Route Corridor identified as being of Very High Value or High Value.

12.92 Table 12.5 demonstrates that five heritage assets of Medium Value have been identified within the Proposed Route Corridor, or in the case of features identified from cropmarks on aerial photographs which may extend into the Proposed Route Corridor but which have not been confirmed by the geophysical survey results. A further three assets having been defined as Low Value. The historic landscape character of the Stage 1 Assessment Corridor has been broadly defined as piecemeal enclosure with areas of 20th century agglomerated fields of Low Value.

12.93 There are geophysical anomalies interpreted as potential archaeological features along with a general potential for buried archaeological remains to be present within the Application Area. The presence, nature, date and significance of any potential features remains unknown and as such they are deemed to be of Unknown Value.

12.94 The monument/group numbers forming the first column of Table 12.5 are given with reference to Figures 2.1 and 2.2 of Technical Appendix 12.

<table>
<thead>
<tr>
<th>Table 12.5 Value of heritage assets (receptors) sensitive to the proposed development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monument/ Group No.</td>
</tr>
<tr>
<td>Very High Value</td>
</tr>
<tr>
<td>High Value</td>
</tr>
<tr>
<td>Medium Value</td>
</tr>
</tbody>
</table>
Table 12.5 Value of heritage assets (receptors) sensitive to the proposed development

<table>
<thead>
<tr>
<th>Monument/Group No.</th>
<th>Description and location</th>
<th>Period</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA6</td>
<td>Possible Iron Age or Romano-British Unclassified Cropmarks, Moss</td>
<td>Iron Age/Romano-British</td>
<td>None</td>
</tr>
<tr>
<td>WA16</td>
<td>Cropmark enclosures and ditches</td>
<td>Iron Age/Romano-British</td>
<td>None</td>
</tr>
<tr>
<td>WA41</td>
<td>Potential Roman wood</td>
<td>Romano-British</td>
<td>None</td>
</tr>
<tr>
<td>WA125</td>
<td>Unclassified Cropmark and Earthwork, Moss</td>
<td>Undated</td>
<td>None</td>
</tr>
<tr>
<td>N/A</td>
<td>Preserved Ridge and Furrow Earthworks</td>
<td>Medieval to post-medieval</td>
<td>None</td>
</tr>
<tr>
<td><strong>Low Value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA77</td>
<td>Aire and Calder Canal</td>
<td>19th century</td>
<td>None</td>
</tr>
<tr>
<td>N/A</td>
<td>Hedgerows identified on pre-1845 maps still present today</td>
<td>Post-medieval to 19th century</td>
<td>'Important' Hedgerows under Hedgerow Regulations 1997 (amended 2002)</td>
</tr>
<tr>
<td>N/A</td>
<td>Drainage ditches identified on 18th and 19th century historic maps</td>
<td>Post-medieval to 19th century</td>
<td>None</td>
</tr>
<tr>
<td>N/A</td>
<td>Historic landscape character</td>
<td>Post-medieval to modern</td>
<td>None</td>
</tr>
<tr>
<td><strong>Negligible Value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Potential unidentified buried archaeological remains, geophysical anomalies interpreted as potential features, within the Proposed Route Corridor</td>
<td>Unknown</td>
<td>None</td>
</tr>
<tr>
<td><strong>Unknown Value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 12.5 Value of heritage assets (receptors) sensitive to the proposed development

<table>
<thead>
<tr>
<th>Monument/Group No.</th>
<th>Description and location</th>
<th>Period</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Potential palaeochannels identified from LiDAR data</td>
<td>Unknown</td>
<td>None</td>
</tr>
</tbody>
</table>

Future Baseline

12.95 If the Proposed Development did not proceed, it is anticipated that the baseline air quality would remain largely unchanged from that which has been predicted for 2014.

Potential Effects

12.96 Groundwork associated with the construction of the Proposed Gas Pipeline will include, but are not limited to:
- Stripping of topsoil within a 30 m wide Working Width
- Open cut trenching along much of the route
- Trenchless construction where the route crosses some roads/railways/motorways/rivers/drainage ditches
- Removal of hedgerows within a 12 m narrowed working area.

Potential Construction and Decommissioning Effects

Archaeology

12.97 Potential construction effects on the archaeological resource include:
- Permanent, complete or partial loss of archaeological features or deposits as a result of ground excavation
- Permanent or temporary loss of the physical and/or visual integrity of a monument
- Damage to resources as a result of ground vibration caused by construction traffic

12.98 There are no potential effects on the archaeological resource expected when the pipeline is decommissioned.

12.99 The results of the desk-based assessment show that archaeological remains of Medium, Low and Unknown Value are present within the Stage 1 Assessment Corridor.

12.100 Earthworks, which may represent settlement remains, were identified directly to the northeast of Scheduled Fenwick moated site. Ridge and furrow, also thought to be associated with the medieval settlement in the area, was identified extending across the Proposed Route Corridor to the northeast and south of the moated site. These
remains are considered to be of Medium Value. The linear nature of the Proposed Gas Pipeline would mean a Low impact on these assets, resulting in a Minor Adverse effect. These assets are associated with Fenwick moated site and therefore physical impacts to these assets would also result in a Low impact to the setting of Fenwick moated site, resulting in a Minor Adverse effect on its setting.

12.101 Other areas of ridge and furrow earthworks have been identified as extending across the Proposed Route Corridor which are considered to be of Medium Value. Again, the linear nature of the Proposed Gas Pipeline will have a Low impact on these assets resulting in a Minor Adverse effect on them.

12.102 Archaeological remains identified through cropmarks from aerial photographs of Medium Value have also been identified close to the Proposed Route Corridor, which relate to known and potential Iron Age and/or Romano-British remains. If these assets extend across the Proposed Route Corridor the construction of the Proposed Gas Pipeline would have a High impact upon these heritage assets (those that are within 100m of the Proposed Route Corridor - Possible Iron Age or Romano-British unclassified cropmarks at Moss, unclassified cropmark and earthwork at Moss, cropmark enclosures and ditches, cropmark ditches, potential linear features identified on aerial photographs), resulting in a Moderate Adverse effect on these assets.

12.103 One archaeological asset of Medium Value is located adjacent to the Proposed Route Corridor relating to potential Roman woodland. The Proposed Gas Pipeline would have a Low impact these assets resulting in a Minor Adverse effect.

12.104 The potential for unknown archaeological features to survive within the Proposed Route Corridor has been recognised. Groundworks associated with the Proposed Gas Pipeline have the potential to directly impact these features. Should these features be located along the Proposed Gas Pipeline then the impacts upon them would be High. However, as their value is currently Unknown, the effect remains Unknown, but likely ranging from Minor to Moderate Adverse.

Geophysical Survey

12.105 The geophysical survey has identified potential archaeological features as anomalies along the Proposed Route Corridor. Groundworks associated with the Proposed Gas Pipeline have the potential to directly impact these features. Should these features be located along the Proposed Gas Pipeline then the impacts upon them would be High. However, as their value is currently Unknown, the effect of the Proposed Gas Pipeline remains Unknown, but likely ranging from Minor to Moderate Adverse.

LIDAR Assessment

12.106 The assessment of the LIDAR data has identified potential archaeological features as anomalies along the Proposed Route Corridor. Groundworks associated with the Proposed Gas Pipeline have the potential to directly impact these features. Should these features be located along the Proposed Gas Pipeline then the impacts upon them would be High. However, as their value is currently Unknown, the effect of the Proposed Gas Pipeline remains Unknown, but likely ranging from Minor to Moderate Adverse.

Built Heritage

12.107 Built heritage assets of Medium Value have been identified close to the Proposed Route Corridor. Approximately 190m east of the Proposed Route Corridor, the Grade II Listed Buildings of Fenwick Hall and its associated out-buildings are located within Fenwick moated site. The Proposed Gas Pipeline is considered unlikely to cause a direct physical impact to these assets, however, temporary impacts upon their settings may occur during the construction of the Proposed Gas Pipeline. The temporary impacts to the settings of these assets are considered to be Negligible, resulting in a Minor Adverse effect upon them.

12.108 The settings of built heritage assets of Medium and High Value, identified within a Zone of Visual Influence adjacent to the Stage 1 Assessment Corridor (see Technical Appendix 12.1: Figure 4), may also be temporarily indirectly impacted upon during the construction. Temporary impacts to the settings of these assets are considered to be Negligible, resulting in a Minor Adverse effect upon them.

12.109 One built heritage asset of Low Value has been identified within the Proposed Route Corridor (The Aire and Calder Canal). The impact of the Proposed Gas Pipeline is considered to be Low, resulting in a Minor Adverse effect.

Historic Landscape

12.110 Historic landscape features, including ‘Important’ hedgerows, post-medieval and 19th century drains and post-medieval to modern fieldscapes, have been identified within the Proposed Route Corridor and are deemed to be of Low Value. Potential construction impacts to these features include direct physical impacts relating to the removal of hedgerows and open cut excavations through drains. These impacts are deemed to be Low, resulting in a Minor Adverse effect.

Potential Operational Effects

12.111 The Proposed Gas Pipeline would be buried along its length, therefore, following the implementation of a mitigation strategy by design and during the construction phase of the scheme, no operational effects are likely to occur.

12.112 Operational effects as a result of the construction of the Above Ground Installation (AGI) at the northern end of the Proposed Route Corridor may include Negligible impacts on the visual character of a historic landscape of Low Value, resulting in Negligible Adverse effect.
Mitigation

12.113 Mitigation measures can be employed prior to and during the construction of the Proposed Gas Pipeline in order to avoid and/or reduce any potential residual effects of the Proposed Gas Pipeline on identified heritage assets. Refer to Table 12.6 for feature specific mitigations.

Mitigation By Design

12.114 The Stage 1 Assessment Corridor contains a number of heritage assets of High, Medium, Low and Unknown Value. The Proposed Route Corridor has been altered to avoid directly impacting known heritage assets within the Stage 1 Assessment Corridor, including the Scheduled Monument Fenwick Hall. Directional drilling the pipeline beneath all major watercourses, thus avoiding direct physical impacts to these features, has also already been proposed. For certain locations of the Proposed Route Corridor, there is also an option to use trenchless methods should any highly significant heritage assets be identified in any area.

12.115 Given the potential for currently unknown buried archaeological remains along the route of the Proposed Gas Pipeline, including cropmark features which may continue into the Proposed Route Corridor, further assessment is required in order to establish the presence and significance of these remains. This would take the form of trial trenching a percentage of the Proposed Route Corridor appropriate for the perceived archaeological potential. This will likely comprise targeting areas of greater archaeological potential, such as those identified during the geophysical survey, along with a smaller sample in areas with less potential. The scope of the trial trenching will be set out in a Written Scheme of Investigation prepared following consultation with the necessary statutory authorities and to be secured through the DCO.

12.116 This would allow for the formulation of an appropriate mitigation strategy which is likely to include a programme of Strip, Map and Record over areas proved to contain archaeological features from trial trenching.

12.117 The need for, scale, scope and nature of any further archaeological works will be agreed through consultation with the statutory authorities.

Mitigation During Construction

12.118 The areas along the Proposed Gas Pipeline not included in the programme of Strip, Map and Record may be required to be monitored in the form of a watching brief during soil stripping. The need for and scale of the watching brief will be agreed through consultation with the statutory authorities.

12.119 In the case of the historically 'Important' hedgerows within the Proposed Gas Pipeline, re-planting of these hedgerows with suitable native species, following consultation with a suitable qualified Ecological Specialist, could serve to mitigate the small scale loss of assets which is likely to occur as a result of the construction of the Proposed Gas Pipeline.

12.120 Impacts to post-medieval and 19th century drainage can be mitigated by carrying out a watching brief during construction works affecting these features, as well as their re-instatement following the completion of construction.

Mitigation During Operation

12.121 The Proposed Gas Pipeline will be buried along its length, therefore, following the implementation of a mitigation strategy by design and during the construction phase of the scheme, it is not anticipated that any mitigation will be necessary during the operation of the Proposed Gas Pipeline.

Assessment of Residual Effects

12.122 Following the implementation of the mitigation measures discussed above, the significance of effect of the Proposed Gas Pipeline upon heritage assets would be reduced. However it should be noted that archaeological mitigation through preservation by record cannot be considered to entirely mitigate the effects of development, as the archaeological resource, considered to be irreplaceable by NPPF, will still be permanently removed. As such, some adverse effect will remain, albeit considerably reduced.

Residual Construction Effects

12.123 Should the Proposed Gas Pipeline directly physically impact any of the identified heritage assets within the Proposed Route Corridor, preservation by record would be necessary. The effect of the Proposed Gas Pipeline on these assets would then be reduced to Minor or Negligible Adverse, depending on the value of the asset.

12.124 It is considered that the temporary adverse effects of the construction upon the settings of designated heritage assets located within the Proposed Route Corridor and in the wider landscape could be satisfactorily reduced by location of the pipeline and the construction works away from the designated structures. This would result in a Negligible Adverse residual effect of the development.

12.125 Directional drilling of the pipeline beneath the route of the Aire and Calder Canal would result in the reduction of the effect to No Impact.

12.126 The re-planting of the Important hedgerows along the Proposed Gas Pipeline would result in a Negligible Adverse residual effect during the construction phase of the development.

12.127 Conducting a watching brief during excavations beneath drains would result in a Negligible Adverse residual effect on these assets.
Residual Operational Effects

12.128 The direct adverse effects incurred upon the archaeological remains along the route of the Proposed Gas Pipeline during the construction phase would be permanent and irreversible and would therefore remain as **Minor to Negligible Adverse**.

12.129 Following the completion of the construction phase, temporary adverse effects on the settings of heritage assets would be reversed.

12.130 It is unlikely that further residual effects on the historic landscape along the Proposed Gas Pipeline would occur following the re-instatement of **Important** hedgerows and other field boundaries.

### Table 12.6 Predicted Significance of Effect and Proposed Mitigation Measures Ascribed to Heritage Assets

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Magnitude</th>
<th>Significance</th>
<th>Proposed mitigation</th>
<th>Residual significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>of impact</td>
<td>of effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(before</td>
<td>(before</td>
<td>If encountered,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>mitigation)</td>
<td>mitigation)</td>
<td>preservation by</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>record through</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>excavation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very High Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Value</td>
<td>Setting of Fenwick Moated Site (Scheduled Monument).</td>
<td>Negligible</td>
<td>Minor Adverse</td>
<td>The location of pipeline has been moved away from the monument and the associated earthworks identified during the walkover survey, so that impact upon associated assets is reduced and the temporary visual impact on the Scheduled Monument during construction is reduced</td>
<td>Negligible Adverse</td>
</tr>
<tr>
<td>Low Value</td>
<td>Aire and Calder Canal</td>
<td>Low</td>
<td>Minor Adverse</td>
<td>Directional drilling beneath the canal</td>
<td>No Impact</td>
</tr>
<tr>
<td>N/A</td>
<td>Hedgerows identified on pre-1845 maps still present today</td>
<td>Low</td>
<td>Minor Adverse</td>
<td>Re-instatement of boundaries following construction</td>
<td>Negligible Adverse</td>
</tr>
<tr>
<td>N/A</td>
<td>Drainage ditches identified on 18th and 19th century historic maps</td>
<td>Low</td>
<td>Minor Adverse</td>
<td>Watching brief during construction works. Re-instatement of drains following construction</td>
<td>Negligible Adverse</td>
</tr>
<tr>
<td>N/A</td>
<td>Preserved Ridge and Furrow Earthworks</td>
<td>Medium</td>
<td>Minor Adverse</td>
<td>Re-instatement of earthworks following construction.</td>
<td>Negligible Adverse</td>
</tr>
<tr>
<td>N/A</td>
<td>Unclassified Cropmark and Earthwork, Moss</td>
<td>High</td>
<td>Moderate Adverse</td>
<td>If encountered, preservation by record through excavation</td>
<td>No Impact or Minor Adverse</td>
</tr>
<tr>
<td>N/A</td>
<td>Cropmark enclosures and ditches</td>
<td>Low</td>
<td>Moderate Adverse</td>
<td>If encountered, preservation by record through excavation</td>
<td>No Impact or Minor Adverse</td>
</tr>
<tr>
<td>N/A</td>
<td>Potential Roman wood</td>
<td>Low</td>
<td>Minor Adverse</td>
<td>If encountered, preservation by record through excavation</td>
<td>No Impact</td>
</tr>
<tr>
<td>N/A</td>
<td>Possible Iron Age or Romano-British Unclassified Cropmarks, Moss</td>
<td>High</td>
<td>Moderate Adverse</td>
<td>If encountered, preservation by record through excavation</td>
<td>No Impact or Minor Adverse</td>
</tr>
</tbody>
</table>
### Table 12.6 Predicted Significance of Effect and Proposed Mitigation Measures Ascribed to Heritage Assets

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Magnitude of impact</th>
<th>Significance of effect (before mitigation)</th>
<th>Proposed mitigation</th>
<th>Residual significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Historic landscape character</td>
<td>Low</td>
<td>Minor Adverse</td>
<td>Re-instatement of boundaries following construction</td>
<td>Negligible Adverse</td>
</tr>
</tbody>
</table>

#### Negligible Value

- None

#### Unknown Value

<table>
<thead>
<tr>
<th>Potential archaeological remains</th>
<th>Potential unidentified buried archaeological remains, including geophysical anomalies and anomalies identified from LiDAR data interpreted as potential archaeological features, within the Proposed Route Corridor.</th>
<th>High</th>
<th>Unknown Adverse</th>
<th>If encountered, preservation by record through excavation.</th>
<th>Minor Adverse</th>
</tr>
</thead>
</table>

| Palaeo-environmental evidence     | Potential palaeochannels identified from LiDAR data                                                              | High | Unknown Adverse | A programme of palaeo-environmental and geoarchaeological evaluation | Minor Adverse |

### Cumulatives

12.131 Based on the site allocations information provided within Appendix 2.3 and the recommended mitigation strategy outlined above, no cumulative effects have been identified.

### Summary

12.132 The Proposed Gas Pipeline traverses an area which has produced evidence for human activity from the prehistoric period onwards. Although the landscape to the west is thought to have been more heavily utilised during the Iron Age and Romano-British period, evidence for settlement and activity has been found in close proximity to the Proposed Route Corridor.

12.133 The Proposed Route Corridor was most likely used for agricultural purposes throughout the medieval and post-medieval periods. The landscape, low lying and frequently flooded, required drainage measures in order to improve the agricultural output and evidence for post-medieval drainage and land management can be seen throughout the area.

12.134 Mitigation measures can be employed prior to and during the construction of the Proposed Gas Pipeline in order to avoid and/or reduce any potential residual effects of the Proposed Gas Pipeline on identified heritage assets. These can include a trial trench evaluation along select areas of the Proposed Route Corridor. This can be followed by a programme of Strip, Map and Record where significant archaeological features are identified. The trial trench evaluation and Strip, Map and Record can be secured as a Written Scheme of Investigation approved by the relevant planning authorities.

12.135 An archaeological watching brief may be required during soil stripping along sections of the Application Area. This work would be undertaken during the construction of the Proposed Development.

12.136 The need for, scale, scope and nature of any further archaeological works will be agreed through consultation with the statutory authorities.

12.137 The highest value ascribed to the known heritage assets located within the Stage 1 Assessment Corridor is High. This relates to the medieval moated site at Fenwick, which is protected as Scheduled Monument. The Proposed Route Corridor has thus been routed away from Fenwick Hall and as a result will have No Impact on these remains. The effect on the setting of this monument has been reduced following mitigation in the form of design measures to Negligible Adverse.

12.138 Buried archaeological remains of Medium and Unknown Value relating to potential Iron Age and/or Romano-British remains, identified close to the Proposed Route Corridor as cropmarks from aerial photographs, are likely to be subject to Moderate Adverse significance of effect as a result of the construction of the Proposed Gas Pipeline if they extend across the Proposed Route Corridor. The recommended mitigation strategy of trial trenching followed by a programme of Strip, Map and Record over areas proven to contain archaeological features will cause the effects to be Minor Adverse.
12.139 Anomalies identified as potential archaeological features from the geophysical survey and interpretation of LiDAR data of **Unknown Value** are likely to be subject to an **Unknown Adverse** significance of effect as a result of the construction of the Proposed Gas Pipeline. The recommended mitigation strategy of trial trenching followed by a programme of Strip, Map and Record over areas proven to contain archaeological features will cause the effects to be **Minor Adverse**.

12.140 Anomalies identified as potential palaeochannels from interpretation of LiDAR data within the Proposed Route Corridor are currently considered to be of **Unknown Value** with the construction of the Proposed Gas Pipeline likely resulting in an **Unknown Adverse** effect on any such features. Further palaeo-environmental and geoarchaeological evaluation may be secured through the DCO and undertaken pre-construction in order to mitigate against any effect the construction process may have on the potential palaeochannels.

12.141 It is considered that the effects of the Proposed Gas Pipeline upon the settings of built heritage assets of **Medium** and **High Value**, located within the Proposed Route Corridor and within the Zone of Theoretical Visibility, would be **Minor Adverse**. However, these effects would be temporary and would be reversed following the completion of the pipeline construction reducing the temporary effects upon the settings of these assets to **Negligible**.

12.142 The effect of the Proposed Gas Pipeline upon The Aire and Calder Canal, a built heritage asset of **Low Value**, is considered to be **Low**, with the effect reduced to **No Impact** following design measures comprising directional drilling beneath the canal.

12.143 It is considered that, following mitigation, the effects of the Proposed Gas Pipeline upon historic landscape features would be reduced to **Negligible Adverse**.