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# 12. Cultural Heritage

## 12.1 Introduction

- 12.1.1 This chapter reports the results of baseline studies and the assessment of the potential impacts of the proposed post-combustion carbon capture (PCC) developments (the ‘Proposed Developments’ comprising the Proposed Phillips 66 Development and the Proposed VPI Development) on archaeology and cultural heritage. The chapter details the methodology followed for the assessment, summarises the regulatory and policy framework related to archaeology and cultural heritage and provides an overview of the existing baseline conditions. Following this, the design of the Proposed Developments as well as mitigation and residual effects are discussed, along with any limitations of the assessment.
- 12.1.2 This chapter is also supported by the following appendices and associated figures located in ES Volume II:
- Appendix 12A: Archaeology and Cultural Heritage Desk-based Assessment;
    - Figure 12A.1: Location of designated heritage assets;
    - Figure 12A.2: Location of non-designated heritage assets;
    - Figure 12A.3: Location of archaeological events; and
    - Figure 12A.4: Historic Landscape Characterisation
  - Appendix 12B: Geophysical Survey Report (VPI Site);
  - Appendix 12C: Ground Investigation Watching Brief Report (VPI Site).
- 12.1.3 Heritage assets are defined within the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021) as “*A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest*”.
- 12.1.4 Heritage assets include those that are designated under legislation (such as listed buildings and scheduled monuments) as well as those that are non-designated. Non-designated heritage assets are assets that are considered to have a degree of local interest or significance usually recognised by local planning authorities (LPA) either by their inclusion within the local Historic Environment Record (HER) or by local listing.

## 12.2 Legislation and Planning Policy Context

### Legislation

#### The Planning (Listed Buildings and Conservation Areas) Act 1990

- 12.2.1 The Planning (Listed Buildings and Conservation Areas) Act 1990 (the Act) sets out the principal statutory provisions that must be considered in the determination of any application affecting listed buildings and conservation areas.
- 12.2.2 Section 66 of the Act states that in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. By virtue of Section 1(5) of the Act a listed building includes any object or structure within its curtilage.

### **The Ancient Monuments and Archaeological Areas Act (1979)**

12.2.3 The Ancient Monuments and Archaeological Areas Act imposes a requirement for Scheduled Monument Consent for any works of demolition, repair, and alteration which might affect a designated Scheduled Monument.

12.2.4 This Act is the central piece of legislation that protects the archaeological resource. The first section of the Act requires the Secretary of State for National Heritage to maintain a schedule of nationally important sites. For the purposes of the Act, a monument is defined as:

*“a) any building, structure or work, whether above or below the surface of the land, and any cave or excavation; b) any site comprising the remains of any such building, structure or work or of any cave or excavation; and c) any site comprising, or comprising the remains of, any vehicle, vessel, aircraft or other moveable structure or part thereof which neither constitutes nor forms part of any work which is a monument as defined within paragraph a) above; d) and any machinery attached to a monument shall be regarded as part of the monument if it could not be detached without being dismantled” (Section 61 (7)).*

12.2.5 The Act further defines an ancient monument as:

*“any Scheduled Monument; and any other monument which in the opinion of the Secretary of State is of public interest by reason of the historic, architectural, traditional, artistic or archaeological interest attaching to it” (Section 61 (12)).*

12.2.6 A set of criteria, defined as survival/ condition, period, rarity, fragility/vulnerability, diversity, documentation, group value and potential, assist in the decision-making process as to whether an asset is deemed of national importance and best managed by scheduling.

### **National Planning Policy Framework (2021)**

12.2.7 The NPPF (MHCLG, 2021) sets out the Government’s planning policies for England and how these should be applied to contribute to the achievement of sustainable development. The NPPF requires plans, both strategic and non-strategic, to make provision for the conservation and enhancement of the historic environment (paragraphs 15, 17, 18 and 20(d)).

12.2.8 The NPPF sets out the importance of being able to assess the significance of heritage assets that may be affected by a development proposal. Significance is defined in Annex 2 as *“the value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting”*. The setting of a heritage asset is defined in Annex 2 as *“the surroundings in which a heritage asset is experienced”*. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset’s importance and no more than is sufficient to understand the potential impact of the proposal on their significance (paragraph 194). Similarly, there is a requirement on local planning authorities to identify and assess the significance of any heritage asset that may be affected by a proposal; and that they should take this assessment into account when considering the impact of a proposal on a heritage asset (paragraph 195).

### **Planning Practice Guidance (2019)**

12.2.9 The Planning Practice Guidance (PPG) (MHCLG, 2019) is a government produced interactive on-line document that provides further advice and guidance that expands the policy outlined in the NPPF. It expands on terms such as ‘significance’ and its importance in decision making. The PPG clarifies that being able to properly assess the nature, extent and the importance of the significance of the heritage asset and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals (paragraph 008 Reference ID: 18a-008-20190723).

12.2.10 The PPG states that in relation to setting a thorough assessment of the impact on setting needs to take in to account, and be proportionate to, the significance of the heritage asset

under consideration and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it (paragraph 009 Reference ID: 18a-009-20190723).

- 12.2.11 The PPG discusses how to assess if there is substantial harm. It states that what matters in assessing if a proposal causes substantial harm is the impact on the significance of the asset. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed (paragraph 017). Generally, harm to heritage assets can be avoided or minimised if proposals are based on a clear understanding of the heritage asset and its setting (paragraph 008 Reference ID: 18a-008-20190723).
- 12.2.12 The NPPF indicates that the degree of harm should be considered alongside any public benefits that can be delivered by a development. The PPG states that these benefits should flow from the proposed scheme and should be of a nature and scale to be of benefit to the public and not just a private benefit and would include securing the optimum viable use of an asset in support of its long-term conservation (paragraph 020 Reference ID: 18a-020-20190723).

### **Hedgerow Regulations (1997)**

- 12.2.13 Hedgerows of historic importance are afforded protection under The Hedgerow Regulations 1997, section 97 of the Environment Act 1995. The Regulations came into effect on 1 June 1997 and any hedgerow, which is defined, at that date, as being of historical or ecological importance may require consent from the local planning authority prior to removal. Although afforded protection by statute, historically important hedgerows are not considered to be 'designated' assets.

## **Local Planning Policy**

### **The North Lincolnshire Local Development Framework**

- 12.2.14 The North Lincolnshire Local Plan was adopted in 2003 by North Lincolnshire Council (NLC) and some of the policies are 'saved' (NLC, 2011a). However, this was largely replaced by the North Lincolnshire Local Development Framework (LDF) which was adopted in June 2011 (NLC, 2011b). The LDF is a suite of Development Plan Documents (DPDs) which set out the local planning policy for the area. However, a number of the policy and policy directions contained within the North Lincolnshire Local Plan (2003) were retained (where they did not become part of the Core Strategy or Housing and Employment Land Allocations DPDs, see below). The core documents of the LDF are then:
- Saved Policies Direction from the 2003 Local Plan (NLC, 2011a), which includes much of chapter 12 'Landscape and Conservation' and chapter 14 'Historic Environment';
  - The Core Strategy (NLC 2011c);
  - The Housing and Employment Land Allocations DPSs (part of the Local Development Framework – NLC 2011b); and
  - The Lincolnshire Lakes Area Action Plan (NLC 2016).
- 12.2.15 It is also worth noting that a new Local Plan is currently under review. Once complete this will be incorporated into the Local Development Framework, replacing the Saved Policies from the 2003 Local Plan. NLC currently aim to adopt this new local plan in 2023 (NLC, 2022). At the time of writing, with reference to Heritage assets, the first two documents listed above are the most important.

### **The North Lincolnshire Local Plan 2003 – Saved Policies Direction**

- 12.2.16 The retained policy directions from chapter 12 'Landscape and Conservation', which relate to Heritage assets include the below. Note that subsequent to these being written Planning Policy Guidance (PPG) notes 15 and 16 (Department of the Environment and the Department of National Heritage 1994 and 1990) have been superseded by the NPPF and Planning Practice Guidance (MHCLG, 2021 and 2019).
- 12.2.17 LC13 - Parks, Gardens and Landscapes of Special Historic Interest states the character and features of parks and gardens of historic or landscape interest will be preserved and

enhanced. Development within or adjacent to those listed in the Register of Parks and Gardens of Special Historic Interest, which is maintained by English Heritage, will not be permitted if this would adversely affect their special historic character and appearance or their setting. Where development is permitted the use of conditions or planning obligations to ensure the protection and enhancement of special features will be sought.

12.2.18 Paragraph 12.25 states:

*“12.25 Historic parks, gardens and landscapes are an important part of the heritage and environment of North Lincolnshire. Nationally, English Heritage is currently updating the Register of Parks and Gardens of Special Historic Interest and PPG15 indicates the desirability of protecting such sites. In addition to these nationally important sites, there are other significant sites of regional or local importance which should be protected from harm and enhanced where possible. “*

12.2.19 Chapter 14 ‘The Historic Environment’ notes:

*“14.1 The Local Plan aims to maintain and enhance the quality of the historic environment, through policies that control development and enable the promotion of schemes of enhancement and improvement throughout these areas. This heritage will be protected from harmful change, whilst allowing for sympathetic adaptation and re-use.”*

and

*“14.35 Archaeological remains are a finite and non-renewable resource and form an important part of our national heritage, valuable for their own sake and for their role in education and tourism. They contain irreplaceable information about the past and are highly vulnerable to damage and destruction.”*

12.2.20 The retained policies from this chapter are HE2, 3, 4, 5, 6, 7, 8, and HE9. Policies HE2-4 relate to conservation areas (which the Proposed Developments Sites (‘the Sites’) are not within or near) and HE7 to advertisement on Listed Buildings. Therefore, in relation to the Proposed Developments the most relevant retained policies are those described below:

- HE5 - Development affecting Listed Buildings – *“The Council will seek to secure the preservation, restoration and continued use of buildings of special architectural or historic interest. When applications for planning permission relating to a listed building or listed building consent are being assessed, the primary consideration will be the need to preserve or enhance the fabric and character of the building. Permission or consent will not be granted unless it has been demonstrated that the proposed works would secure this objective. The Council will encourage the retention and restoration of the historic setting of listed buildings. Proposals which damage the setting of a listed building will be resisted. Whenever appropriate, proposals which would entail the loss of historic fabric from a listed building will be conditional upon a programme of recording being agreed and implemented.”;*
- Paragraph 14.28 - *“Alterations and additions should not adversely affect the essential character of the building, should be in keeping with its architectural style and features and should harmonise with its surroundings. In particular such development will have to be of a high standard of design. The external appearance and materials will be expected to match, as near as possible those of the existing building in kind and in detail.”;*
- Paragraph 14.29 - *“The setting of a building of special architectural or historic interest often contributes to its character. The setting could be its garden, grounds, open space or the general street scene. Developers are advised to contact the Council at an early stage to discuss the nature and extent of the setting. It is therefore important to consider the impacts of development and other proposals within the vicinity of listed buildings. Control over the quality of design of new development in close proximity to a listed building will be necessary to protect its setting. Conditions may need to be imposed on such development to achieve the quality required.”;*

- Paragraph 14.30 - *“The best way of preserving the character and appearance of buildings of architectural or historic importance will be to keep them in their original use. Some listed buildings are no longer required for their original use and there is a danger that they could lie empty and fall into disrepair, causing an eyesore and increasing pressure for them to be demolished. Therefore, there is a need to be flexible in considering alternative uses for such buildings if that use holds the key to a building’s preservation. For such a change of use to be acceptable, it should maintain the integrity of the building in terms of its appearance and character. This might include retaining the original interior layout and important architectural features.”* ;
- HE6 - Demolition of Listed Buildings – *“Consent for the demolition of listed buildings will not be granted other than in the most exceptional circumstances and only when the planning authority is satisfied that every possible effort has been made to continue the present use or find a suitable alternative use, and such efforts have failed. Whenever appropriate, proposals which would entail the loss of historic fabric from a listed building will be conditional upon a programme of recording being agreed and implemented.”*;
- Paragraph 14.31 - *“Before demolition can take place on Grade II listed buildings, or demolition or part demolition takes place on Grade II, Grade II\* or Grade I listed buildings, listed building consent must be given which entails consultation with the Secretary of State for the Environment who makes the final decision. Other interested organisations are also consulted. These include English Heritage, the Council for British Archaeology, the Ancient Monuments Society, the Georgian Group and the Victorian Society.”*;
- Paragraph 14.32 - *“Listed buildings are of recognised architectural or historic interest and their loss through demolition would be detrimental to the character and appearance of the surrounding area and to the overall heritage of North Lincolnshire. Demolition will therefore only be allowed in the most exceptional circumstances and only if this is the last feasible option. Following demolition of the listed building, the site may be of archaeological interest and Policy HE10 will apply.”* [Note that this policy (HE10) has not been retained]. ;
- HE8 - Ancient Monuments – *“Development proposals which would result in an adverse effect on Scheduled Ancient Monuments and other nationally important monuments, or their settings, will not be permitted.”*;
- HE9 - Archaeological Evaluation - *“Where development proposals affect sites of known or suspected archaeological importance, an archaeological assessment to be submitted prior to the determination of a planning application will be required. Planning permission will not be granted without adequate assessment of the nature, extent and significance of the remains present and the degree to which the proposed development is likely to affect them. Sites of known archaeological importance will be protected. When development affecting such sites is acceptable in principle, mitigation of damage must be ensured and the preservation of the remains in situ is a preferred solution. When in situ preservation is not justified, the developer will be required to make adequate provision for excavation and recording before and during development.”*;
- Paragraph 14.39 – *“In accordance with PPG16, the planning authority will require sufficient information from applicants to assess the potential impact of their proposals on any archaeological remains and their settings. This will enable informed planning decisions to be taken. In some cases, an archaeological assessment will be required which may comprise a desk-based study, or fieldwork, including geophysical survey and limited trial trenching. To avoid potential delays in determining planning applications, developers are strongly recommended to include, as part of site feasibility research, an initial investigation to establish whether the site in question is known to contain or likely to contain any archaeological remains. SMR staff check all planning applications against the record in order to determine their potential effect on Scheduled Monuments or sites of archaeological importance and will advise the planning authority of the appropriate course of action.”*;

- Paragraph 14.41 – *“Where development sites are shown to contain significant archaeological remains which would be adversely affected, the planning authority will need to be satisfied that adequate mitigation measures will be implemented. The preferred option for important archaeological remains is preservation in situ; this may be achieved by modification of proposals, where appropriate, for example changes in site layout or redesign of foundation construction.”; and*
- Paragraph 14.42 - *“Where the preservation of the site in situ is not feasible, evidence will be required to demonstrate that the developer has made appropriate and satisfactory provision for the recording of the remains, in consultation with officers of the SMR who will advise the planning authority. Preservation by record can take place either in advance of or during development and may involve full excavation followed by post-excavation analysis and publication of results. Planning conditions or legal agreements will be used to secure this work.”*

### **The Core Strategy (2011)**

#### 12.2.21 The Core Strategy (NLC, 2011c) states at paragraph 3.1

*“The Core Strategy sets out the long-term spatial planning framework for the development of North Lincolnshire up to 2026 by providing strategic policies and guidance to deliver the vision for the area including the scale and distribution of development, the provision of infrastructure to support it and the protection of our natural and built environment with a strong focus on the principles of sustainable development. The spatial strategy set out in this document has been shaped by national and regional planning policy as well as the Sustainability Community Strategy. Other influences include extensive public consultation, the Sustainability Appraisal/Strategic Environmental Assessment and the evidence base.”*

#### 12.2.22 The Core Strategy document identifies a number of Spatial Objectives and Core Strategies (CS). Of particular relevance to the Proposed Developments are:

- Spatial Objective 6: Protecting and Enhancing the World Class Environment -
  - Paragraph 4.23 *“To conserve and enhance our world class environments of the Humber Estuary and Crowle Moors and improve our other natural, historic and built landscapes as well as guiding changes in a way which reduces and takes proper account of environmental impact, climate change and sea level rise.”; and*
  - Paragraph 4.24 *“North Lincolnshire’s natural, built and historic environment makes the area very attractive as a place to live, work, visit and invest. The Local Development Framework will create a policy framework that safeguards, enhances, and promotes North Lincolnshire’s internationally, nationally and locally recognised areas for nature conservation importance and biodiversity, including the Humber Estuary and Crowle Moors. The framework will pay particular regard to the maintenance, restoration and re-creation of priority habitats and species as well as the creation of new habitats and the development of a green infrastructure network.”;*
- CS1: Spatial Strategy for North Lincolnshire -
  - *“e) Supporting the protection and enhancement of North Lincolnshire’s world class natural and built environment to ensure the continued attractiveness of the area as place to live, work and visit.”;*
  - *“The internationally and nationally designated sites of nature conservation importance of the Humber Estuary and Thorne and Hatfield Moors will be protected and enhanced. In the Humber Estuary area, particularly where the expansion of the South Humber ports is likely to occur, a strategic approach to the creation of new habitats will be adopted. This will ensure that the collective impact of major developments are designed to secure positive environmental benefits from flood management and development proposals.”;*
  - *“North Lincolnshire’s townscapes and historic landscapes will also be protected and enhanced and high quality design encouraged. In particular, the*

- nationally significant historic landscapes of the Isle of Axholme and Crowle Moors will be conserved and their potential as a tourist and educational resource realised.”, and*
- *“Where development unavoidably has an environmental impact adequate mitigation measures should be used for the development to be acceptable.”;*
  - CS5: Delivering Quality Design in North Lincolnshire -
    - *“Ensure [that new development] takes account of the existing built heritage from the earliest stages in the design process, in particular terms of scale, density, layout and access.”, and*
    - *“7.19 The policy will mainly be implemented through the development control process. Further information and advice on how to design buildings and spaces sustainably will be provided in a Supplementary Planning Document (SPD).”;*
  - CS6: Historic Environment -
    - *“The council will promote the effective management of North Lincolnshire’s historic assets through:*  
  
*Safeguarding the nationally significant medieval landscapes of the Isle of Axholme (notably the open strip fields and turbaries) and supporting initiatives which seek to realise the potential of these areas as a tourist, educational and environmental resource.*  
  
*Preserving and enhancing the rich archaeological heritage of North Lincolnshire.”,*
    - *“The council will seek to protect, conserve and enhance North Lincolnshire’s historic environment, as well as the character and setting of areas of acknowledged importance including historic buildings, conservation areas, listed buildings (both statutory and locally listed), registered parks and gardens, scheduled ancient monuments and archaeological remains.”,*
    - *“Development proposals should provide archaeological assessments where appropriate.”, and*
    - *“7.20 The aim of this policy is to ensure that North Lincolnshire’s important sites and areas of historic and built heritage value are protected, conserved and enhanced in order that they continue to make an important contribution to the area’s scene and the quality of life for local people.”; and*
  - CS16: North Lincolnshire’s Landscape, Greenspace and Waterscape -
    - *“The council will protect, enhance and support a diverse and multi-functional network of landscape, greenspace and waterscape”,*
    - *“4. Requiring the protection of trees, hedgerows and historic landscape to be specified where appropriate.”, and*
    - *“11.38 The policy will be implemented through:*  
  
*Identifying greenspace sites in supporting documents within or evidencing the LDF, and through the consideration of planning applications”.*

## Other Guidance

### Historic England Guidance

- 12.2.23 Historic England has published a series of Good Practice Advice (GPA) of which those of most relevance to this appraisal are GPA2 - Managing Significance in Decision-taking (Historic

England, 2015b) and GPA3 - The Setting of Heritage Assets (2nd Edition) (Historic England, 2017).

- 12.2.24 GPA2 emphasises the importance of having a knowledge and understanding of the significance of heritage assets likely to be affected by the development and that the “first step for all applicants is to understand the significance of any affected heritage asset and, if relevant the contribution of its setting to its significance” (paragraph 4). Early knowledge of this information is also useful to a local planning authority in pre-application engagement with an applicant and ultimately in decision making (paragraph 7).
- 12.2.25 GPA3 provides advice on the setting of heritage assets. Setting is as defined in the NPPF and comprises the surroundings in which a heritage asset is experienced. Elements of a setting can make positive or negative contributions to the significance of an asset and affect the ways in which it is experienced. Historic England state that setting does not have a boundary and what comprises an asset’s setting may change as the asset and its surrounding evolve. Setting can be extensive and particularly in urban areas or extensive landscapes can overlap with other assets. The contribution of setting to the significance of an asset is often expressed by reference to views and the GPA in paragraph 11 identifies those views such as those that were designed or those that were intended, that contribute to understanding the significance of assets.
- 12.2.26 Historic England’s Advice Note 12 (Historic England, 2019a) outlines a recommended approach to assessing the significance of heritage assets in line with the requirements of NPPF. It includes a suggested reporting structure for a ‘Statement of Heritage Significance,’ as well as guidance on creating a statement that is proportionate to the asset’s significance (heritage value) and the potential degree of impact of a proposed development.
- 12.2.27 The process of evaluating the consequences of change is split into three stages: Understanding change, Assessing impact and Weighing the effect. All aspects of a proposal that have the ability to change a cultural heritage asset or its setting are first explained. If these changes affect the cultural significance of the asset the resulting impact, which could be positive or negative, and its magnitude is then assessed. The effect is a combination of the magnitude of the impact and the cultural heritage asset’s importance, and the scale of the effect will determine by how much the issue should influence the design of the proposal and whether the proposal is acceptable and will be permitted.

### **Chartered Institute for Archaeologists**

- 12.2.28 The baseline study has been undertaken in accordance with guidance published by the Chartered Institute for Archaeologists (CIfA), with specific regard to the Standard and Guidance for Historic Environment Desk-based Assessment (CIfA, 2020b) and the Code of Conduct (CIfA, 2021).

### **Principles of Cultural Heritage Impact Assessment in the UK**

- 12.2.29 Principles of Cultural Heritage Impact Assessment (CHIA) provides guidance on understanding cultural heritage assets and evaluating the consequences of change (CHIA 2020b).
- 12.2.30 Understanding cultural heritage assets is split into three stages: Description, Significance and Importance. The description arrives at a factual statement that establishes the nature of the asset. The heritage values of the asset are then analysed (the guidance stresses that these include but are not limited to aesthetic, historic, scientific, social or spiritual values) and a statement of cultural significance given. Finally, the importance of the asset is assessed, and a conclusion drawn as to the level of protection that the asset merits in planning policy and cultural heritage legislation. The guidance notes that unlike cultural significance importance is scaled and can be described as high, medium or low.
- 12.2.31 The process of evaluating the consequences of change is split into three stages: Understanding change, assessing impact and weighting the effect. All aspects of a proposal that could change a cultural heritage asset or its setting are first explained. If these changes affect the cultural significance of the asset the resulting impact, which could be positive or negative, and its magnitude is then assessed. The effect is a combination of the magnitude

of the impact and the cultural heritage asset's importance and the scale of the effect will determine by how much the issue should influence the design of the proposal and whether the proposal is acceptable and will be permitted.

## 12.3 Assessment Methodology and Significance Criteria

### Overview

- 12.3.1 This section outlines the methodology employed for establishing the baseline conditions for archaeology and cultural heritage and for assessing the likely significant effects arising from the construction and operation of the Proposed Developments.
- 12.3.2 The heritage baseline conditions relevant to this assessment are detailed in the Archaeology and Cultural Heritage Desk-based Assessment which is presented at Appendix 12A in ES Volume II. The desk-based assessment has been undertaken in accordance with guidance and regulations published by the Chartered Institute for Archaeologists (CHIA 2020b), specifically the Standard and Guidance for Historic Environment Desk-Based Assessment and guidance and advice notes published by Historic England.

### Study Areas

- 12.3.3 The study area for the assessment of all heritage assets (designated and non-designated assets) is defined as a 1 km buffer surrounding the Sites. For designated heritage assets only, the study area extends to a 5 km buffer surrounding the Sites. The study areas have been defined based on the geographic and land use / landscape contexts in which the Sites are located, in order to identify assets, their setting and geographical extent.
- 12.3.4 The study areas are shown on Figure 12A.1 – 12A.4 (in Appendix 12A, ES Volume II) and have been agreed with the Historic Environment Officer for NLC.

### Data Sources

- 12.3.5 This baseline conditions for archaeology and cultural heritage, as reported in Appendix 12A, has been developed through consultation of the following information sources:
- the Historic Environment Record (HER) data from:
    - North Lincolnshire Council (NLC),
    - North East Lincolnshire Council (NELC), and
    - Lincolnshire County Council (LCC);
  - the North Lincolnshire Historic Landscape Characterisation (NLHLC) data;
  - Historic England's National Heritage List for England (NHLE) - data including listed buildings, world heritage sites, scheduled monuments, registered battlefields and registered parks and gardens;
  - databases of known archaeological sites, find spots, historic buildings and previous archaeological works, including Archaeology Data Service;
  - geological records from the British Geological Society (BGS);
  - aerial photographs obtained from the HER and on and through Google Earth;
  - NLC's online land, planning and development website and the planning and advice documents contained within;
  - Historic Ordnance Survey and pre-Ordnance Survey mapping from online archives and the National Library of Scotland (NLS);
  - various documentary and internet sources, including British History Online;

- consultation with the Heritage Officer for NELC and the Historic Environment Officer for NLC;
- local authority conservation area appraisal and management documents and their mapping;
- National Record of the Historic Environment (NRHE) held by Historic England;
- Heritage Gateway for former National Monuments Record and excavation index data <http://www.heritagegateway.org.uk/gateway/>;
- National Library of Scotland for historic maps <https://maps.nls.uk/>;
- vertical aerial photography of the study area available from the National Collection of Aerial Photographs <https://ncap.org.uk/> and LiDAR imagery available from <http://www.geostore.com/environment-agency/survey.html#/survey>;
- relevant records available from the Portable Antiquities Scheme <http://finds.org.uk/database/>; and
- the results of geophysical survey investigations carried out for the Proposed VPI Development.

## Determining the Value of Heritage Assets

- 12.3.6 The value of a heritage asset is guided by its designated status but is derived also from its heritage interest. The NPPF defines value as “*the value of a heritage asset to this and future generations because of its heritage interest*”, which comprises archaeological, architectural, artistic and historic interest. The value of a heritage asset can therefore be defined by the sum and understanding of its heritage interest.
- 12.3.7 Advice Note 12, published by Historic England (2019a) outlines a recommended approach to assessing the value of heritage assets in line with the requirements of NPPF. It includes a suggested reporting structure for a ‘Statement of Heritage Significance’, as well as guidance on creating a statement that is proportionate to the asset’s significance (heritage value) and the potential degree of impact of a proposed development.
- 12.3.8 Advice Note 12 also offers an interpretation of the various forms of heritage interest that an asset can possess, based on the terms provided in the NPPF Glossary (MHCLG 2019), as follows:
- **Archaeological Interest** – there will be archaeological interest in a heritage asset if it holds, or has the potential to hold, evidence of past human activity worthy of expert investigation at some point;
  - **Architectural and Artistic Interest** – these are interests in the design or general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative skills, such as sculpture; and
  - **Historic Interest** – an interest in past lives and events (including pre-historic). Heritage assets can illustrate or be associated with them. Heritage assets with historic interest not only provide a material record of our nation’s history but can also provide meaning for communities derived from their collective experience of a place and can symbolise wider values such as faith and cultural identity.
- 12.3.9 Taking into account the NPPF and published advice, each heritage asset has been assigned a value in accordance with the criteria set out in Table 12.1. Professional judgement and the results of consultation also contribute to the assessment of value, and regional variations, contribution to regional research agenda, and the individual qualities of assets have been considered where applicable.

**Table 12.1: Criteria for determining the value of heritage assets**

<b>Value</b>	<b>Guidelines</b>
High	Assets of international importance, such as World Heritage Sites, Grade I and II* listed buildings, Grade I and II* registered historic parks and gardens, Registered battlefields, Scheduled monuments, Non-designated archaeological assets of schedulable quality and importance.
Medium	Grade II listed buildings, Grade II listed registered historic parks and gardens, Conservation Areas, Locally listed buildings included within a Conservation Area Non-designated heritage assets of a regional resource value.
Low	Non-designated heritage assets of a local resource value as identified through consultation; Locally listed buildings.
Very Low	Non-designated heritage assets whose heritage values are compromised by poor preservation or damaged so that too little remains to justify inclusion into a higher grade.

### Determining the Magnitude of Impact

- 12.3.10 The method for determining the magnitude of impact to heritage assets follows the same process for both construction and operational impacts and is set out in Table 12.2..
- 12.3.11 Impacts may arise during construction or operational activities and can be temporary or permanent. Permanent impacts could entail the removal of buried archaeological features; temporary impacts may comprise construction activities within the setting of a heritage asset. The magnitude of impact arising from construction and operational activities considers mitigation measures which have been embedded within the Proposed Developments as part of the design development process.

**Table 12.2: Criteria for Determining the Magnitude of Impact**

<b>Impact</b>	<b>Guidelines</b>
High	Change such that the significance of the heritage asset is totally altered or destroyed, for example the permanent and complete removal of a heritage asset and total loss of heritage value. Comprehensive change to setting affecting significance, resulting in a serious loss in the ability to understand and appreciate the asset.
Medium	Change such that the significance of the asset is affected, for example, a significant proportion of a heritage asset is removed permanently, resulting in a loss of heritage value which affects the ability to understand the asset's character and function. Noticeably different change to setting affecting significance, resulting in erosion in our ability to understand and appreciate the asset.
Low	Change such that the significance of the asset is slightly affected. For example, a small proportion of a heritage asset is removed permanently resulting in a small loss of heritage value; however, this does not affect the ability to understand and/ or characterise the resource. Slight change to setting affecting significance resulting in a change in our ability to understand and appreciate the asset.
Very Low	Changes to the asset that hardly affect significance. Minimal change to the setting of an asset that have little effect on significance resulting in no real change in our ability to understand and appreciate the asset.

## Significance of Effect

- 12.3.12 The assessment to classify the effect, having taken into account any embedded mitigation, is determined using the matrix at Table 12.3.
- 12.3.13 The effect to heritage assets is determined by cross-referencing the value of the asset with the magnitude of impact it is likely to experience as a result of the Proposed Developments. Effects can be beneficial, neutral or adverse. Major and moderate effects are considered to be significant in accordance with EIA practise. Minor and negligible effects are considered to be not significant.

**Table 12.3: Matrix Used to determine the significance of potential effects**

Magnitude of Impact	Sensitivity of Receptor				
	Negligible	Low	Medium	High	Very High
High	Minor	Moderate	Moderate	Major	Major
Medium	Negligible	Minor	Moderate	Moderate	Major
Low	Negligible	Negligible	Minor	Moderate	Moderate
Negligible	Negligible	Negligible	Negligible	Minor	Minor

- 12.3.14 If appropriate, additional mitigation is proposed where significant effects have been identified. An assessment of the significance of effect following the implementation of additional mitigation allows the residual effect to be recorded. It is noted that mitigation does not automatically reduce an effect but may be used to offset or compensate for an adverse effect.

## Cumulative Effects

- 12.3.15 The cumulative effects of the Proposed Developments in conjunction with other proposed developments in the vicinity of the Proposed Developments have been assessed. This has been done qualitatively through consideration of any proposed developments with planning consent secured or those identified in NLC or NELC that could have an impact on archaeology and cultural heritage, including impacts from changes to an asset's setting.
- 12.3.16 The cumulative assessment has considered the presence of the Proposed Developments in combination with the cumulative schemes (consented and application schemes) where there is a potential for significant cumulative cultural heritage effects. This part of the assessment is reported in ES Chapter 18: Cumulative and Combined Effects, ES Volume I.

## Limitations and Assumptions

- 12.3.17 Heritage data has been obtained from third party sources and the assessment of effects is based on the accuracy of this information. Although data from HERs and the NHLE are generally reliable, on occasion asset data may be omitted, incorrectly named, have incorrect coordinate data, or be out of date.
- 12.3.18 The impact assessment assumes that the construction of the Proposed Developments would result in the permanent and total loss of any heritage assets contained within the Proposed Developments footprints, and as such the assessment presents the worst case impacts.

## Consultation

- 12.3.19 Consultation with Historic England would be undertaken where there is the potential for a proposed development to impact designated assets. There is no requirement for Scheduled Monument Consent in this instance, and there are no adverse effects on grade I and II\* listed buildings identified. Historic England have therefore not been consulted with regards to the Proposed Developments.

**Table 12.4: Table of Consultation Undertaken**

Consultation date	Consultee	Comment	Actions
8 <sup>th</sup> December 2021	The Historic Environment Officer for NLC	<p>The Historic Environment Officer (HEO) for NLC indicated that EIA will need to include:</p> <ul style="list-style-type: none"> <li>the results of archaeological field evaluation of the Sites – to include both non-intrusive and intrusive survey work (field evaluations);</li> <li>assessment of significance based on the results of these completed field evaluations and including the contribution of settings to significance;</li> <li>assessment of the impact of the Proposed Developments;</li> <li>mitigation for the Proposed Developments based on the field evaluation results.</li> </ul>	<ul style="list-style-type: none"> <li>Geophysical Survey completed as of October 2022</li> <li>Trial trench evaluation being planned in liaison with the HEO for NLC as of November 2022</li> <li>Commitment to integrate results of work into relevant documentation (DBA, ES etc)</li> <li>Commitment to design further appropriate migration works based on results of earlier work, in liaison with HEO for NLC</li> <li>Submission of DBA and ES for review and comment at appropriate times</li> </ul>
8 <sup>th</sup> December 2021	Heritage Officer for NELC	No Comment	Submission of DBA and ES for review and comment at appropriate times

## 12.4 Baseline Conditions (including Future Baseline Conditions)

### Overview

- 12.4.1 A detailed assessment of archaeological and cultural heritage baseline conditions is presented in the Cultural Heritage Desk-based Assessment presented in Appendix 12A in ES Volume II. A summary of baseline conditions is presented below.
- 12.4.2 All assets identified within the study areas, irrespective of whether they would be affected by the Proposed Developments, are listed in Appendix 12A (ES Volume II). Assets are identified within the text by unique identifiers, [Ax] for archaeological assets, [BHx] for built heritage assets, both designated and non-designated, and [RPGx] for Registered Parks and Gardens. All heritage assets identified within the study areas are illustrated on Figures 12A.1 – 12A.2. Archaeological events are identified within the text by [Ex] and illustrated on Figure 12A.3. All figures are provided in Appendix 12A, ES Volume II.

### Topography

- 12.4.3 The topography of the area comprises a low-lying estuarine landscape. This consists of extensive stretches of intertidal habitats containing mudflats, salt marsh, coastal dunes and wetland adjacent to the Humber Estuary.
- 12.4.4 The surrounding land-use is dominated by the large heavy industrial areas around the villages of Killingholme and Immingham. This industrial land-use is mixed with interspersed pockets

of flat open farmland, woodland and natural coastal habitats. There is more sporadic development to the north of the Sites as the land-use becomes more rural with more isolated development.

### Phillips 66 Site

- 12.4.5 The Phillips 66 Site is defined as the area of the proposed Phillips 66 PCC plant, which is located with the bounds of the extant and operational Humber Refinery. The majority of the proposed Phillips 66 PCC plant area is currently used for open storage and temporary uses such as site cabins for maintenance contractors, and some permanent buildings (to be demolished). There are also areas of existing utilities (above ground pipelines on rack) and internal roadways within the Phillips 66 Site and in the eastern of part of the Phillips 66 Site, railway sidings and part of the National Rail operated railway line between Grimsby, Immingham and Ulceby. The westernmost part of the proposed Phillips 66 Site is used for car parking.
- 12.4.6 The topography levels have been determined using LiDAR imagery, which shows that the Humber Refinery sits on a slight mound. This means that the average height of the Phillips 66 Site is c.12 m Above Ordnance Datum (AOD) but it slopes down to c.10 m AOD towards the north and west, to c. 8 m AOD to the east and south, with a maximum height of c.17 m AOD towards the middle of the Phillips 66 Site.
- 12.4.7 The Phillips 66 Site covers c. 15.68 ha.

### VPI Immingham (VPI) Site

- 12.4.8 The VPI Site is defined as the area which encompasses both the location of the proposed VPI PCC plant and the extant VPI Immingham Combined Heat and Power (CHP) plant. The location of the proposed VPI PCC plant is currently an area of open scrubland to the immediate south of the extant VPI Immingham CHP plant. This open area is bisected by a watercourse (and open ditch) maintained by North East Lindsey Internal Drainage Board (IDB).
- 12.4.9 The topography levels have been determined using LiDAR imagery, which shows that the VPI Site is located on a relatively gentle west (c. 7 m AOD) to east (c. 3 m AOD) slope with an average height of c.5 m AOD.
- 12.4.10 The VPI Site covers 28.51ha.

### Geology and Soils

- 12.4.11 According to the British Geological Survey (BGS) Geology of Britain Viewer, the superficial deposit which underlies the eastern edge of the VPI Site is by tidal flat deposits comprising clay and silt. The Tidal Flats are described by the BGS as “*normally consolidated soft silty clay, with layers of sand, gravel and peat; characteristically low relief; from the tidal zone*”. These Tidal Flat Deposits are designated as unproductive strata with low permeability; however permeable sands are likely to contain groundwater. A thin ribbon of this material also extends into the north eastern edge of the Phillips 66 Site.
- 12.4.12 The superficial deposit which underlies the remainder of the Sites is Till, Devensian deposits comprising diamicton. The Till is described by the BGS as “*unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.*” The Tidal Flat Deposits are designated as unproductive strata with low permeability; however permeable sands are likely to contain groundwater. The Till is classified as a secondary (undifferentiated) aquifer which is assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
- 12.4.13 The underling bedrock geology beneath both Sites forms part of the Burnham Chalk Formation. The BGS describes this as “*white, thinly-bedded chalk with common tabular and*

*discontinuous flint bands; sporadic marl seams*". The Burnham chalk formation is designated as a Principal Aquifer. Principal Aquifers usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

- 12.4.14 Soils across much of the VPI Site are described on Cranfield Soil and Agrifood Institute's Soils mapping as "loamy and clayey soils of coastal flats with naturally high groundwater". Across the southern edge of the VPI Site, and all of the Phillips 66 Site, the soils are described as "slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils". These overlying soils are described as having a high leaching potential.
- 12.4.15 The historic and current industrial land-uses within the Sites and the surrounding 1 km study area indicate that there is the possibility for the presence of potential contaminants in ground.
- 12.4.16 The VPI Site consists of an existing CHP in the northern half of the VPI Site and open scrubland in the southern half. There are no obvious indicators of significant historic industrial development within this southern half of the VPI Site but it is adjacent to larger industrial developments to the north and west and there is a railway line adjacent to the VPI Site's western boundary.
- 12.4.17 The Phillips 66 Site has been and is currently in industrial use – the same railway runs partially into the northern/ eastern part of the Phillips 66 Site.

## Historic Landscape Characterisation

- 12.4.18 The NLHLC data is formed of an assessment of historic and current mapping that separated blocks of landscape into types and then subtypes based on either morphology or land use. A total of six NLHLC types encompassing 25 subtypes are present within the 5 km study area and listed in Table 12.5.

**Table 12.5: Lincolnshire Historic Landscape Character types and sub types within the 5 km study area.**

Type	Subtype	Period
Communications	Cuttings and Embankments	Modern
Communications	Junction	Modern
Communications	Sidings	Post Medieval to Modern
Communications	Sidings	Modern
Fields and Enclosed Land	Ancient Enclosure	Medieval to Modern
Fields and Enclosed Land	Ancient Enclosure	Post Medieval to Modern
Fields and Enclosed Land	Modern Fields	Modern
Fields and Enclosed Land	Parliamentary Planned Enclosure	Post Medieval to Modern
Industry	Car Storage	Modern
Industry	Chemical Works	Modern
Industry	Derelict Industrial Land	Modern
Industry	Other Industrial Works	Modern
Industry	Warehouses and Distribution	Modern
Recreational Open Space	Golf Course	Modern
Settlement	Detached Housing (C19th)	Post Medieval to Modern

Type	Subtype	Period
Settlement	Detached Housing (C20th)	Modern
Settlement	Historic Settlement Core	Early Medieval to Modern
Settlement	Isolated Farmstead	Post Medieval to Modern
Settlement	Isolated Farmstead	Modern
Settlement	Planned Residential Development	Modern
Settlement	Pre 1960s Semi Detached Housing	Modern
Settlement	Pre 1960s Semi Detached Housing	Modern
Settlement	Village Farmstead	Post Medieval to Modern
Woodland	Other Woodland	Modern
Woodland	Plantation Woodland	Modern

- 12.4.19 Figure 12A.4 (in Appendix 12A, ES Volume II) demonstrates that the majority of the Phillips 66 Site and the northern half of the VPI Site lie within the NLHLC subtype ‘Chemical Works’ (modern). The southern half of the VPI Site lies within the subtype ‘modern fields’ (modern). To the east of the VPI Site the land is noted as ‘Parliamentary Planned Enclosure (post medieval to modern)’. To the south of both, the land is ‘Chemical works’ (modern). To the west of the Phillips 66 Site the land is characterised primarily as ‘Fields and Enclosed Land’ (modern) although areas of ‘Warehouse and Distribution’ (Modern) are also seen. To the north of both sites is the Lindsey oil Refinery (‘Chemical works, modern’).
- 12.4.20 In addition to the above data, the region of and around the Proposed Developments was also part of the Lincolnshire Historic Landscape Characterisation Project, which commenced in 2008 and completed in September 2011. It used GIS mapping to categorise and characterise the landscape of the county over time. The process involved the definition of landscape types which were used to categorise all portions of the landscape. These were then grouped into ‘character zones’ of coherent landscape blocks which were, in turn, grouped into larger ‘character areas’, the largest landscape components of the study.
- 12.4.21 The area of the Proposed Developments, as well as the areas to the east, south and immediate north falls into **NOM2: The Northern Marshes (Immingham Costal Marshes)**. This is broadly defined as a zone dominated by industrial activity (comprising 36% of the character zone) and which, prior to enclosure in the 18<sup>th</sup> century, was mainly comprised of saltmarsh grazing land. The zone is largely modern in character although historic elements can still be identified in the landscape.
- 12.4.22 The area to the west of the Proposed Phillips 66 Development, as well as the area further to the north of the Sites (beyond the Lindsey Oil Refinery) fall into **NOM1: The Northern Marshes (The Humber Bank)**. This zone is primarily rural (open fields) with small towns, villages and isolated farmsteads. The area was active since the Domesday survey and whilst much of coastal area comprised low lying coastal marsh, this area was generally higher and (from relict ridge and furrow) part of an open farming regime. The medieval landscape is still visible in this area – some settlements retain their historic cores and earthworks represent the sites of former monasteries and other buildings.

## Archaeological and Historical Background

- 12.4.23 This archaeological and historical background section provides a chronological narrative of the known baseline conditions for the Proposed Developments. Known heritage assets within the study areas and within the Site boundaries are referenced in the text.

## **Prehistoric (c. 700,000 BC to AD 43)**

### ***Palaeolithic (c. 700,000 – 11,600 BC)***

- 12.4.24 At around 27,000 – 21,000 BP (towards the end of the Palaeolithic period), the Sites would have sat under the North Sea Ice sheet, a little to the south of the great meltwater lake known as the 'Humber Lake'. As the ice receded the lake silted up and it, and the area around it, became a peaty woodland (Straw, 2016) and over time marshland (Green, 2015). This is important as recent studies have demonstrated that these peaty marshlands near the Humber estuary offered valuable resources to prehistoric - medieval populations which made them attractive. This combined with the high degree of archaeological preservation afforded by this environment makes these locations archaeological very significant (Van de Noort, 2004).
- 12.4.25 Within the 5 km study area there are no known palaeolithic sites or find spots. The North Lincolnshire HER contains an entry for the historical position of the tidal high-water mark, reflecting Holocene sea level change, prior to large scale drainage. The HER records this as being within the parish of North Killingholme, but its precise location is not recorded/ known ([A1]).

### ***Mesolithic (c. 11,600 – 4,300 BC)***

- 12.4.26 The natural environment changed dramatically during the Mesolithic period as temperatures rose and forest cover spread (typically mixed deciduous forest), however this did not occur uniformly, and some regions experienced retarded vegetation development (Allen and Gardiner, 2009). The first areas occupied were often these areas where vegetation had not flourished, or where deliberate clearance had taken place. This is represented in the toolkits of the Mesolithic period, which contain specialist wood working / tree felling equipment (transversely sharpened axes and adzes) and items suited to more mobile lifestyles and the hunting of game within more enclosed areas.
- 12.4.27 It also appears that at this time the coastline of North Lincolnshire/ North East Lincolnshire lay c. 50 km to the east of its current position (Shennan *et al.* 2000) and what is now the North Sea was an area of dry land (known as Doggerland) which extended as far north as Shetland and, in places, connected the British Isles with continental Europe. This condition appears to have persisted until c.6000 BC, by which time the coastline was only a little to the east of its modern location. This flooding had a dramatic effect on the vegetation of the region, with the mature mixed deciduous forest that had once stretched out onto the North Sea plain being replaced by wetlands and a coastal landscape.
- 12.4.28 There are no designated Mesolithic assets within the 5 km study area. Within the 1 km study area, Mesolithic material has been recovered at six locations ([A2 – A7]). The most significant of these would appear to be [A3] located c.640 m to the south of the Phillips 66 Site, [A4] located c.490 m north of the VPI Site and [A5], located c.900 m south of the Phillips 66 Site. These are more significant as they not isolated finds, but rather locations where groups of flint/ flint scatters have been found and so possibly indicating locations of *in situ* Mesolithic activity/ occupation.
- 12.4.29 [A7] is the only asset which sits within the bounds of one of the Sites (the VPI Site). Fieldwalking in the area in 1999 uncovered 233 pieces of flint over the walked area. Many of these were undiagnostic and possible natural in origin. However diagnostically Mesolithic, Neolithic and Bronze Age material was recovered, and the assemblage suggested that local flint was being collected and knapped at this site.

### ***Neolithic (c. 4,300 – 2,200 BC)***

- 12.4.30 The Neolithic period marks the adoption of agriculture associated with more widespread tree clearance and associated changes in flint tools. With this people adopt a more settled lifestyle – which is more visible in the archaeological record. Pottery appears and it is also when the first monuments are constructed; in Lincolnshire it is notable that the long barrows which typify this period are located on the eastern side of the Wold.
- 12.4.31 In the Humber region, during the Neolithic and Early Bronze Age sea-level rise continued—albeit now significantly slower. This appears to have caused coastal areas to be submerged

by the rising tide, and by c. 2,000 BC the Lincolnshire coastline lay significantly inland of its current position.

- 12.4.32 There are no designated Neolithic assets within the 5 km study area. Within the 1 km study area, there are three assets with a Neolithic component to them, **[A8 – A10]**. These assets are broadly similar in nature to the ones mentioned above and are clustered towards the north east of the Sites – generally towards the Killingholme area suggesting that this location may be a significant focus for Neolithic activity. Asset **[A8]** (c. 890 m north-west of the VPI Site) consists of a significant flint tool assemblage, as does asset **[A10]**, c.960 m north of the VPI Site. Asset **[A9]**, c. 650 m north of the VPI Site indicated the possibility of the activity in this area having some element high status to it as it represents the discovery of partially complete polished stone axe.
- 12.4.33 There are no Neolithic assets within the bounds of the Sites themselves.

### ***Bronze Age (c 2,200 – 750 BC)***

- 12.4.34 Centralised, permanent, settlement and associated agricultural practices intensify during this period with more and more land being cleared. The environment, generally, takes on a much more open aspect and field systems begin to emerge. There is, generally, a picture of the widespread accumulation of colluvial material in the archaeological record at this time, presumably derived from human agricultural activity.
- 12.4.35 Material culture reflects these changes as new pottery forms emerge (Renfrew and Cherry, 1986) and metal tools also emerge for the first time, although flint tools are still commonly used, albeit with changed forms (Humphrey, 2003 and 2007). Ritual activity also changes, the long barrows of the Neolithic period being replaced round barrows, these also being more common than their predecessors and seemingly having a territorial, as well as funereal, function (Roskam and Whyman, 2005). During this period the coastline remains relatively static, although there are minor eastwards and westwards movement and much of the area inland of the coast would have been dominated by coastal wetland saltmarsh (Green, 2015).
- 12.4.36 There are no designated Bronze Age assets within the 5 km study area. Within the 1 km study area there are five Bronze Age Assets, **[A10 – A14]**.
- 12.4.37 As previously mentioned, **[A10]** consist of a significant scatter of flint tools collected during fieldwalking. Whilst these had a Neolithic component, there was also a Bronze Age element to the assemblage.
- 12.4.38 Assets **[A11]**, **[A12]** and **[A13]** represent the results of an archaeological evaluation carried out in 2009 near South Killingholme (260 m south-east of the VPI Site). The work identified various deposits (including burnt stone and charcoal) which were found in association with other features such as ditches. The finds (and the scientific dating of the charcoal) dated the site to the later Bronze Age. The remains did not appear to be domestic in nature but rather appeared to be associated with exploitation of the estuarine environment
- 12.4.39 Asset **[A14]** represents another borehole survey (c. 530 m to the north west of the VPI Site) which identified former stream beds of Bronze Age to Iron Age date and which appeared to be related to marine transition.
- 12.4.40 There are no assets within the bounds of the Sites.

### ***Iron Age (c. 750 BC – 43 AD).***

- 12.4.41 The concentration of intensification of settlement and agriculture seen in the Bronze Age period continues throughout the Iron Age period, cremation becomes the main burial custom and material culture continues to develop, not the least of which is the introduction of the new forms of metal working. Occupation centres become more visible as hillfort settlements are established. In Lincolnshire, hillforts tend to be small in both size and number
- 12.4.42 By the end of the Iron Age / start of the Roman period the Humber coastal zone had moved back eastwards from it earlier westward maximum extent.. Salt making appears to become a significant industry at this time (though it may have been practised earlier) and salterns are seen at a number of locations.

- 12.4.43 There are no designated Iron Age assets within the 5 km study area. Within the 1 km study area there are 11 assets of this date [A14 – A22] and [A25-A26]. Asset [A14] has been mentioned above and need not be discussed again here.
- 12.4.44 Asset [A15] is an apparent Iron Age field system identified via archaeological trial trench evaluation in 2006, located 59 m to the north of the VPI Site. [A19] may also represent the remnants of an Iron Age field system, aerial photography indicated that linear features and sub-circular features should be present. However, trial trench evaluation in 2006 discovered only a small number of Iron Age linear ditches. The sub-circular features, whilst targeted by the investigation, were not present in the excavated trenches. This asset is located 98 m north of the VPI Site.
- 12.4.45 Asset [A21] is a large Iron Age ditch, identified via geophysical survey in 2009 and excavated in 2011, located 685 m to the west of the Phillips 66 Site. The size of the feature (>2 m wide and >1 m deep) as well as the large quantity of material recovered suggest that it is not a field division/ boundary ditch but rather part of an enclosure ditch for an area of occupation. Asset [A26] consist of similar features – two large linear ditches which contain notable quantities of late Iron Age pottery. Again, is it is suggested that these features are part of an occupation enclosure rather than a field system. The asset is located 16 m south-east of the VPI Site.
- 12.4.46 Asset [A22] was identified as a ditched enclosure covering and area of 50 m x 50 m and containing a number of sub-divisions via geophysical survey in 2011. Subsequent trial trench evaluation in 2012 confirmed this layout whilst the material assemblage recovered demonstrated domestic, mid-late Iron Age use of the site. The asset is located 900 m north of the Phillips 66 Site.
- 12.4.47 Asset [A25] is another crop mark site identified in aerial photographs dated in 1958. A rectilinear enclosure measuring c.30 m by 20 m and a small L-shaped feature lying just to the north were seen. However, this crop mark lies within the current confines of the Phillips 66 Site and has been destroyed by the construction of the existing Humber Refinery.
- 12.4.48 Asset [A16] was noted via geophysical survey and subsequent trial trench evaluation in 2009. The asset is located 215 m south-west of the VPI Site. The work identified an Iron Age occupation site that appeared to last until the early Roman period. It consisted of a number of sub square enclosures which contained curvilinear feature (possible ring gullies) linear ditches and discrete pit type features, at least one of which was a hearth. Domestic occupation appeared to be concentrated to the west of the site. There was also some evidence for salt making being carried out towards the wetter eastern part of the settlement.
- 12.4.49 Asset [A17] is a major settlement site which has been examined via geophysical survey (2011 and 2012) fieldwalking (2012) and trial trench evaluation (2012). The results of this work present a complex site which covers c. 6ha. The settlement began life in the mid/ late Iron Age and was in use until the mid/ late Roman period. The settlement, broadly, consists of a multi-phased arrangement of interconnected, rectangular, ditched enclosures orientated on and north - south axis. Within these enclosures are numerous features representing structures, animal enclosures, and the sub-division of land plots and fields. Evidence from this period demonstrates that crops were being grown and processed, animals were being reared and that iron was being worked. The asset is located 820 m north of the VPI Site.
- 12.4.50 Asset [A18] is another significant occupation site, subject to geophysical surveys in 2011 and 2012, trial trench evaluation in 2012 and excavation in 2013. The site covers around c. 1.5 ha and featured two large enclosures, a large sub-rectangular enclosure in the southern portion of the site and an elongated enclosure located in the northern part of site. Both enclosures featured internal sub-divisions, with the southern enclosure displaying evidence of six ring gullies and other structural elements. A date range of between the mid to late Iron Age and early 1st century AD has been assigned to them. The asset is located 370 m north-east of the VPI Site.
- 12.4.51 Asset [A20] is a further, significant occupation site with Iron Age origins. Archaeological investigations were undertaken in advance of the construction of part of the VPI Immingham CHP Plant (now part of the VPI Site) between 1999 and 2000. They comprised of a desk-based assessment fieldwalking, geophysical survey auger survey, watching briefs, trial

trenching, and open area excavation. The work revealed that an original early Iron Age settlement was located in the southern part of the investigation area, on lower ground near the former creek on the shore of the River Humber. There then appears, on the basis of the pottery sequence, to have been a hiatus in the mid to late Iron Age. The late Iron Age and Romano-British settlement developed on higher ground further north, centred around a droveway and a pattern of enclosures. The environmental evidence from the excavation reflected a mainly pastoral landscape, with some evidence of cereal cultivation and the possibility of hedge-lined ditches supporting semi-aquatic flora and fauna, including sticklebacks and water voles. Excavations and bore hole surveys suggested that during some periods the shoreline was more inland than previously thought and actually within the confines of the southern part of excavation area itself. The creek or channel was east-west aligned with a broad opening onto the River Humber which then narrowed by two thirds west of the investigation area. Generally, the environment on the Humber shoreline and in the Lincolnshire marsh was a mixed landscape of alder carr, with areas of phragmites reeds. Other data from the area suggests an increase in grass, herb and cereal pollen probably correlating with woodland clearance just prior to the Iron Age, more particularly analysis of samples taken from various features excavated on the site has provided evidence for grassland habitats, including saltmarsh and rough grazing land. The presence of early pottery makes this site **[A20]**, significant in Lincolnshire, where relatively few early to mid-Iron Age settlements have been investigated. The northern part of the settlement appeared to have been unenclosed: although the single roundhouse from this period was found between two boundary ditches, these appeared to represent the subdivision of an open area, as opposed to the enclosure of smaller compounds. The nature of the pottery, the general lack of artefacts, and the environmental evidence from the settlement all suggested a rural, pastoral settlement. Moreover, given the presence of a droveway, ponds, and enclosures interpreted as pens or corrals for livestock, it appeared that the settlement was mainly dependant on raising cattle and sheep/goats. The pottery evidence for the later Iron Age and Romano-British periods suggested that until the mid-2nd century there was a scarcity of imports, and it is likely that at this time the site was of a relatively low status. This asset is located within the VPI Site, at its northern extreme, partially under the extant buildings and partially within the open scrubland area of the Proposed VPI Development.

### ***Undated/ Uncertain Prehistoric Evidence***

- 12.4.52 Within the 1 km area of the study area there are a number of prehistoric sites recorded in the HER which, whilst known to be prehistoric, cannot be definitively placed into any specific period.
- 12.4.53 Asset **[A23]** and **[A24]** are find spots of mixed material comprising a possible Neolithic flint scraper and 3<sup>rd</sup> – 4<sup>th</sup> century greyware pottery from **[A23]** (300 m south of the Phillips 66 Site) and a probable Bronze Age flint knife and similar greyware pottery from **[A24]**. This material is located within the Phillips 66 Site and as a result any local archaeological context from which they may have originated was removed during the construction of the existing Humber Refinery.
- 12.4.54 Asset **[A27]** consists of a double-ditched penannular enclosure, visible on aerial photography. The feature is clearly of prehistoric date, likely Neolithic to Bronze Age and located 840 m to the north west of the VPI Site. An archaeological evaluation at this location in 2014 recorded Roman pottery and features, but the prehistoric ring-ditches were not present (**[A35]**).

### **Romano British (AD 43 – 410)**

- 12.4.55 During the pre-Roman/ late Iron Age period, North Lincolnshire was occupied by the Corieltavi tribe (according to Ptolemy's 2<sup>nd</sup> century *Geography*) whose capital was Ratae Corieltavorum (now Leicester). The Roman Ninth Legion *Hispana* arrived in Lincoln (Roman *Lindum Colonia*) sometime between 50-60AD and established a major fortress, it becoming the functional capital of the region.
- 12.4.56 Three main Roman Roads were established in Lincolnshire, crossing at Lindum. Ermine Street joined Staner Street (the road from Chichester to London) and continued on from London, through Lincoln towards York. The Fosse Way ran from Exeter to Lincoln via the major Roman Settlement of Cirencester. Tillbridge Lane linked Lincoln with the River Trent

and the small town of *Segelocum* (Littleborough on Trent). More locally to the Sites the 'High Street' (more correctly the 'Caistor High Street') was a pre-existing prehistoric trackway which ran along the eastern edge of the Wold linking settlements at Horncastle, Ludford, Caistor and the afore mentioned Yarborough Camp near Kirmington/Croxton before heading on to South Ferriby and Winteringham.

- 12.4.57 The North Lincolnshire coastline continued to regress eastwards in the early Roman period with a subsequent increase in coastal wetlands. However, during the later Roman/early Medieval period (4<sup>th</sup> – 6<sup>th</sup> centuries) the coast appears to have moved westward once again, with Roman coastal sites such as Scupholme and Ingoldmells being buried under 2-3 m of alluvium (Green, 2014).
- 12.4.58 There are no designated Roman sites within the 5 km study area. Within the 1 km study area there are 16 Roman sites, comprising assets **[A16 – A18]**, **[A20 – A21]** and **[A28 – A38]**.
- 12.4.59 Assets **[A16]**, **[A17]**, **[A18]**, **[A20]** and **[A21]** are occupation sites which have all been previously discussed (refer to Iron Age section). These sites simply continue in use into and throughout the Roman period. Roman occupation of these sites appears to reach its peak during the 2<sup>nd</sup> century. Where dates can be certain, the use of these sites appears to continue into the 3<sup>rd</sup> – 4<sup>th</sup> century AD (assets **[A17]**, **[A20]** and **[A21]**). During the latter part of its life (late 2<sup>nd</sup> century onwards) **[A20]** appears to have become more affluent (as represented by the cultural material, including foreign imports) and could be seen as a more moderate to high status site. This asset is located within the VPI Site, partially under the extant buildings of the CHP Plant and partially within the open area of the VPI Site .
- 12.4.60 Assets **[A28]**, **[A30]**, **[A31]**, **[A32]** and **[A34]** are all find spots of Roman pottery (and in the case of **[A28]** a coin of Constantine II) located 200 m – 800 m from the Sites.
- 12.4.61 Asset **[A29]** (820 m north of the Phillips 66 Site) is simply recorded as an occupation site found during the construction of Lindsey Oil Refinery.
- 12.4.62 Asset **[33]** is a Romano-British ladder settlement, recorded by geophysical survey and a metal detecting survey, 605 m south of the Phillips 66 Site. A complex series of rectangular ditches were conjoined to either side of a trackway, in a square area measuring at least 130 m by 140 m.. Some of the positive anomalies within the settlement were suggestive of wall footings and arranged in such a way to suggest buildings. A metal detecting survey found sixteen, 3<sup>rd</sup> and 4<sup>th</sup> century coins, two Roman brooches of the 1st or 2nd century. A Roman lock bolt fragment, 32 sherds of greyware, 30 lead fragments and 14 copper alloy fragments (including part of a vessel). When plotted, it was clear that most of the finds came from the west of the trackway, including all but one of the coins.
- 12.4.63 Asset **[A35]** is a settlement site comprising a large main sub-rectangular enclosure, which contained several ring gullies and other fragmentary structural elements. The main enclosure had several sub-enclosures appended to it and a short stretch of double-ditched trackway was recorded. The features displayed evidence of being re-worked and adapted from the mid to late Iron Age through to the early 2<sup>nd</sup> century AD, with artefactual evidence supporting the chronology. The asset is located 850 m north-west of the VPI Site.
- 12.4.64 Asset **[A36]** is another ladder-type Roman settlement, possibly consisting of one or more farmsteads. The pottery was largely utilitarian shell-gritted ware, typical of the Late Iron Age - Roman transition in North Lincolnshire. One sherd in a cream fabric was thought to originate from a 1<sup>st</sup> century AD kiln at Lincoln, whilst other material was more distinctively late Roman (3<sup>rd</sup> 4<sup>th</sup> century AD). There was also evidence for metalworking residue, fired clay fragments, oyster shells, and animal bone, an assemblage typical of a Roman settlement. The asset is located 330 m north-west of the Phillips 66 Site.
- 12.4.65 Asset **[37]** consist of a series of ditch features were recorded within evaluation trenches. The material recovered from these ditches suggested a Romano-British date and that domestic and/ or industrial activity was taking place in the in the vicinity of them. This asset is located 310 m north-west of the Phillips 66 Site.
- 12.4.66 Asset **[38]** was another group of later Roman ditches, which were recorded during trial excavations in 2012 and 2013. The ditches appeared to be a continuation of field systems

associated with a farmstead or settlement recorded on the west side of Rosper Road [A20]. Very small quantities of Roman pottery were recovered from the fills of the features. It is also worth noting that all of the archaeological features in these trenches were sealed with a thick layer of flood-deposited alluvium, up to 0.90 m deep, lying below the topsoil. The features either side of Rosper Road are likely to represent a farmstead or settlement situated on a small promontory on the palaeo-shoreline. This asset is located 40 m east of the VPI Site.

### Early Medieval (AD 410 – 1066)

- 12.4.67 North Lincolnshire formed part of the Anglo-Saxon Kingdom of Lindsey until the 7<sup>th</sup> century when it was absorbed into Northumbria.
- 12.4.68 There are no designated assets of this date within the 5 km study area. Within the 1 km study area there are three assets - [A17], [A39] and [A40].
- 12.4.69 There is some evidence to support the fact that occupation of settlement [A17] continued into the Saxon period. Asset [A39] comprises a find spot of a single sherd of possible Saxon ware approximately 700 m to the north-west of the Phillips 66 Site.
- 12.4.70 Asset [A40] is a moated site 177 m to the west of the Phillips 66 Site. Whilst largely of medieval date both fieldwalking over the asset in 2011, and a trial trench investigation in 2012, produced quantities of sherds of a late Saxon date, suggesting an earlier origin for the site.

### Medieval (1066 – 1540)

- 12.4.71 The wider region within which the Proposed Developments sit appears likely to have been largely underdeveloped until the early 1900s when the Great Central Railway began developing Immingham Dock. It is likely that the region was dominated by agricultural land interspersed with hamlets and small villages. Indeed, both archaeological and historic evidence demonstrate that the modern villages of East Halton, North Killingholme and South Killingholme may have had medieval predecessors. There is a strong probability that these medieval centres represented the movement and centralisation of populations which were already in these locations during earlier (Roman and Iron Age) periods. The same is true for population centres further afield such as Kirmington and Croxton which were also foci of Iron Age and Roman settlement.
- 12.4.72 The most populated centralised settlement in this region during the medieval period would have been Immingham, 2.5 km to the south of the Sites and Stallingborough (6.6 km to the south-east of the Sites).
- 12.4.73 North and South Killingholme are also recorded in the Domesday Book. The land is split amongst four lords and a number tenants but in total appears to support 67 households, making it one of the largest settlements recorded in Domesday, however this population would not have been as centralised as Immingham. Indeed it is likely these were classic 'row' villages extending along a north-south spine road. Although the detailed topography of the pre-enclosure landscape cannot be recovered, its general principles are clear, not only from later maps, but also from documents, particularly a 1585 survey of East Halton and Killingholme with 18<sup>th</sup> century transcription and a late 18<sup>th</sup> century farm sale brochure. The villages cultivated large tracts of arable in a two open field system, East and West fields, which were separated by the spine road along which the farmsteads and other dwellings lay. The Proposed Developments are located within what is recorded as the 'East Field' on the edge of 'Summergates' – which sits to the east of what is now Rosper Road.
- 12.4.74 East Halton is not mentioned in the Domesday Book but is known to have been occupied both during the early Saxon Period and in the Medieval period, suggesting that its omission is an error, or that the village underwent a period of abandonment from the late Saxon to early/ mid medieval period.
- 12.4.75 Within the 5 km study area, there are 6 designated assets – [A41 – A46] and 24 non designated assets within the 1 km study area, assets [A40] and [A47 – A69].
- 12.4.76 Assets [A41], [A42], [A43] are all enclosed, moated, manor/ farm sites, the closed areas being roughly rectangular in nature. Assets [A41 – A43] all consist of a single enclosure ditch

5 m – 10 m wide and 2 m-3 m deep enclosing areas of 12,000 m<sup>2</sup> (**[A41]**), 800 m<sup>2</sup> (**[A42]**) and 36,000 m<sup>2</sup> (**[A43]**). All present at least some evidence for a bank on the internal side of the moat and with ditch built divisions internal to the areas defined by the moat. All have associated earthworks and features around them (likely the remains of field boundaries and a ridge and furrow ploughing regime). Asset **[A41]** is also associated with a smaller secondary moat to its west (enclosing an area of 3,000 m<sup>2</sup>) and earthworks that would appear to represent two fishponds. None contain any surviving structural evidence. It is possible that **[A41]** the Baysgarth farm moated site and **[A42]**, North Garth may represent the remains of the medieval village of Lopinheham, recorded in Domesday and believed to be in this rough location. The village is recorded as consisting of 75 households, which would have made it a village of significant size. **[A43]** 'Manor Farm' is likely associated with the medieval development of East Halton.

- 12.4.77 Assets **[A41 – A43]** all sit to the north-west of the Phillips 66 Site at distances of 1.5 km – 3.6 km.
- 12.4.78 Asset **[A44]** (also recorded as non-designated asset **[A48]**) is another asset consisting of two rectangular moat enclosures; a larger one (43,200 m<sup>2</sup>) which, in its north-west corner contains a smaller one (50 m<sup>2</sup>). Again, the moat ditch is 10 m wide and 2 m deep with an internal bank. Internal divisions are seen within the enclosed area and earthworks representative of a field system surround it. The chief difference is the presence of extant buildings within the confines of the enclosure – **[BH19]** Manor Farm, a grade II\* listed building dated to the 16<sup>th</sup> Century (NHLE 1346854) and **[BH20]** an associated stables /granary (NHLE 1214980), dated to the 18<sup>th</sup> Century. It is likely these assets (excluding the stables) relate to the medieval origins of North Killingholme. The asset is 990 m north-west of the Phillips 66 Site.
- 12.4.79 Asset **[A45]** lies just within the 5 km study area, to the south of the Sites. It is the location of the remains of the medieval nunnery of Nun Cotham, a priory of Cistercian nuns founded in the mid-12th century and dissolved in 1539. The remains of the nunnery are overlain by those of a post-Dissolution house, garden, farm buildings and other later features. Also associated with the asset are a pair of fishponds and a post-medieval windmill mound. None of the structural remains are standing, surviving now only as low earthworks, many of which are only visible from the air.
- 12.4.80 Asset **[A46]** (3.7 km to the north-west of the Phillips 66 Site) is the site of Thornton Abbey. This was an Augustinian monastery founded as a priory in 1139 by William LeGros, Count of Aumale, and raised to the status of abbey in 1148. It was colonised by twelve black canons from the Augustinian priory at Kirkham in North Yorkshire and became one of the richest Augustinian houses in the country. It was fortified in 1382, this included the construction of a large moat which fed at least two groups of fishponds. After the Dissolution of the Monastery (1539), Henry VIII re-founded the abbey as a college of secular priests and a school for fourteen boys, re-using buildings of the former monastery. This college was suppressed by Edward VI in 1547 and demolished by Sir Vincent Skinner in 1610. Out of the remains, Skinner built a stately house which subsequently collapsed. This house lies within the inner precinct. The site of the cloister ranges were excavated by Charles, first Earl of Yarborough in the 1830s. Much of the ground-plan was uncovered and a typical monastic layout revealed. However, excavation was not carried out below the level of the latest remains and so details of the layout of the first cloister and church, built at the monastery's foundation, are, at present, not understood. The Abbey precinct covers an area of some 29 ha. A number of extant ruins exist within the precinct **[BH1-4,9 & 18]** which represent the remains of the Abbey and its associated outbuildings. The best preserved of these standing remains are of the abbey gatehouse.
- 12.4.81 Non-designated asset **[A51]** is the site of possible medieval farmstead (Enchetun's Toft) which may have sat on the edge of 'Summergates' 580 m to the south-east of the VPI Site.
- 12.4.82 The remaining non-designated assets can be discussed in a number of groups. Assets **[A52]**, **[A53]**, **[A58]**, **[A59]**, **[A60]**, and **[A61]** represent the remains of ridge and furrow activity. These are sometimes visible as extant earthworks and in other instances have been plotted during fieldwalking, geophysical surveys and as crops marks/ earthworks during aerial photographic surveys. These assets demonstrate that the land around the Proposed Developments has a heavy coverage of ridge and furrow remains which appear to come right

up to the west side and south-west corner of the Phillips 66 Site and the south and east side of the VPI Site.

- 12.4.83 Asset **[A53]** consisted of the mapping of ridge and furrow using pre-existing aerial photographs from the 1940s and 1970s as well as new data collected during 2011 (geophysical survey). This work demonstrates that ridge and furrow extends underneath what is now the existing Phillips 66 Humber Refinery site. It is doubtful that any of this survives. Perhaps more significantly the ridge and furrow activity is also seen to cover the location of the current VPI Immingham CHP Plant buildings and the potentially undisturbed southern part of the VPI Site, where there is the potential for preservation.
- 12.4.84 Assets **[A54]**, **[A55]**, **[A56]** and **[A57]** are all medieval ditches noted during various investigative archaeological works, thought to represent field boundary or drainage features. The closest, **[A54]**, is located 75 m to the north of the VPI Site. The remainder are grouped together 225 m to the west of the Phillips 66 Site.
- 12.4.85 Assets **[A66]**, **[A67]**, and **[A68]** all appear to represent historic field boundaries identified via aerial photographs and (in the case of **[A68]** a trial trench evaluation). In all cases these boundaries appear to consist of a ditch and bank which is also overlain by an extant, historically important, hedgerow in the case of **[A68]**. Asset **[A66]** has since been destroyed by the modern coal terminal at the Port of Immingham. Asset **[A67]** has likely suffered the same fate. Asset **[A68]** lies 570 m to the north of the VPI Site. Whilst the archaeological work on this asset confirmed its medieval origin, it lies along the line of a parish boundary (recorded as a ditch) between North and South Killingholme as seen on an enclosure map of 1776-1779.
- 12.4.86 Assets **[A63]**, **[A40]**, **[A47]** and **A62]** are earthworks noted in aerial photographs which appear to represent traces of the shrunken medieval villages of North (**[A63]**) and South Killingholme (**[A40]**, **[A47]** and **[A62]**). These remains intermittently span a 'ribbon' c. 2.5 km long to the north-west and west of the Proposed Developments area. At their closest point to the Proposed Developments the remains sit 175 m to the south-west of the Phillips 66 Site (**[A62]**).
- 12.4.87 Asset **[A64]** and **[A49]** are a findspots of medieval pottery, made 630 m to the south and 830 m to the west of the Phillips 66 Site, respectively. **[A65]** were the earth work remains of a possible Saltern, now destroyed by the afore mentioned modern coal terminal.
- 12.4.88 Asset **[A69]** refers to the currently unlocated asset of Stukeley's Great Castle. The antiquarian William Stukeley mentioned 'a great castle' at Killingholme. It may have been a substantial manor house on one of the moated sites in North or South Killingholme. He also recorded 'occasional finds of Roman pottery and coins'. William Stukeley's mention is short: "*A mile east of Thornton are the ruins of another great castle called Kelingholme*" (Stukely, 1724).
- 12.4.89 Asset **[A50]** is in a similar situation. A manorial chapel at Killingholme is mentioned in c.1320, the abbot and convent of Newhouse were licenced to celebrate in a chapel there. This chapel could have been in either North or South Killingholme, its location is currently unknown.
- 12.4.90 It is notable that the evidence for ridge and furrow and field enclosure appears to indicate that the land in use for arable agriculture tends to stay above or around the 4 m contour – seemingly indicating that at this time land below this height was unsuited to arable agriculture and so either unused or put to pastoral use. This reflects what is known from the pre-enclosure mapping where the areas to the east of Rosper Road are largely recorded as being "marsh".

### **Post Medieval (1540 – 1900)**

- 12.4.91 Throughout the medieval period the coastline of the region has been in slight flux, though largely moving east from the inland position reached towards the end of the Roman/ early Saxon periods. Towards the early/ middle part of this period it reaches a position which broadly resembles the modern coastline (Green, 2012).
- 12.4.92 A map of the North and South Killingholme area post enclosure (1776 – 1779) shows that what was once the East Field is now subdivided into numerous smaller parcels of land (including the area of the Sites). It also shows that the area which was labelled as "Marshes"

has now also been parcelled up and enclosed, suggesting the retreat of the water and the subsequent drying of the coastal wetlands had made these areas usable for arable agriculture. The 1887 Ordnance Survey maps demonstrates that by this time a number of the earlier smaller land parcels have been subsumed into fewer, larger fields, and that the costal (previously marsh area) is still in apparently arable use. A number of land boundaries apparent on this map can still be seen today (see below).

- 12.4.93 There are no designated Post-Medieval archaeological assets within the 5 km study area. There are 26 non designated archaeological assets, **[A70-A95]** within the 1 km study area.
- 12.4.94 A number of assets are visible on the Ordnance Survey (OS) map of 1887, but have subsequently been destroyed and so will not be impacted by the Proposed Developments. This includes assets **[A79]** and **[A84 – A95]** which represent the locations of now demolished 19<sup>th</sup> century farmhouses once associated with North and South Killinghome. These are scattered all around the 1 km study area, the closest being **[A91]** located 30 m to the north east of the VPI Site and **[A88]**, 160 m to the west of the Phillips 66 Site. Asset **[A78 – A82]** are all structural assets other than farms (an inn, a church and two smithies) which were also present on the OS map of 1887 and which have also been subsequently demolished and replaced by modern housing developments. With the exception of **[A81]**, which sits within what is now an open field. The closest of these is **[A82]**, located c.115 m to the west of the Phillips 66 Site. None of these (now demolished) assets sat within the bounds of the Sites.
- 12.4.95 Asset **[A77]** is the site of an extant modern farm (Manor Farmhouse). Present on the OS map of 1887, less than 50% of the original buildings remains **[BH44]**. None of the extant buildings are listed.
- 12.4.96 Asset **[A74]** is a burial ground associated with a Baptist chapel dated to 1792 **[BH22]**, sitting c. 580 m to the south the Phillips 66 Site.
- 12.4.97 Asset **[A70]** and **[A71]** represent the remains of historically important hedgerows that also appear as ditched field boundaries on the 1776 and pre-1840 maps. Between them the assets consist of 15 hedgerows, however now only eight survive/ partially survive, the rest have been removed by the alteration of field boundaries over time (as fields were amalgamated) and modern constructions. One concurrent length of hedge which forms part of **[A70]** and **[A71]** currently runs along a portion of the south-eastern perimeter of the VPI Site.
- 12.4.98 A number of other assets are visible as cropmarks or known from other works none of which have any significant relationship with the Proposed Developments. Asset **[A75]** is another linear ditch (dated to the 16<sup>th</sup> – 18<sup>th</sup> centuries AD), noted during a watching brief on the construction of a new house, the asset was removed as part of these works. **[A83]** is a small pinfold noted on the OS maps of 1887 and 1907 which currently forms part of a residential garden. **[A76]** is a pond noted in OS maps of 1887, modern works have since levelled the asset, but it can still be seen on LiDAR imagery.
- 12.4.99 **[A72]** is an exception to this - a linear cropmark (possibly a ditch) thought to be a medieval / post medieval field boundary, noted in aerial photography and aligning with a field boundary noted on the OS map of 1887. This asset sits within the VPI Site but is not visible as an earthwork from the ground.

### **Modern (1900 – Present)**

- 12.4.100 The region remains largely unchanged until 1912 when the Immingham Docks are constructed (following the passing of the Humber Commercial Railway and Dock Act in 1904), at which point the region undergoes significant industrialisation, including a network of rail to transport goods between Immingham and Grimsby.
- 12.4.101 The extant freight link between Ulceby and Immingham docks runs between the Humber Refinery and the Immingham VPI CHP plant.
- 12.4.102 The area of the Proposed Developments remains as open agricultural land until the construction of the Humber Refinery in 1966 and the construction of VPI Immingham CHP Plant in 2004.

- 12.4.103 There are no designated archaeological assets of this period within the 5 km study area. Within the 1 km study area 23 non-designated assets are known.
- 12.4.104 A number of assets relating to World Wars I and II are present around the Sites, **[A97]**, **[A98]**, **[A101]**, **[A102]**, **[A107-A109]** and **[A111-117]**. These include such things as mission hall, barrage balloon anchorages, anti-aircraft batteries, aircraft obstructions, RAF sites, the site of a WWII prisoner camp, a fuel storage site and a number of bomb craters. The majority of these assets sit some distance from the Proposed Developments. However, **[A116]** (a WWII searchlight emplacement) and **[A101]**, the site of a prisoner of war camp are present within the bounds of the Phillips 66 Site. The camp was used to house 'low category' German prisoners of war. Locally, it was called 'Monkey Camp' after its army code of 'M for Monkey'. The prisoners worked on farms in the area. No army buildings are visible on the OS 6" map of 1947 and the site was not listed in a national survey of prisoner of war camps produced by English Heritage in 2003 (Thomas, 2003).
- 12.4.105 A number of, now demolished, buildings were located on the east side of Rosper Road, close to the east edge of the VPI Site. The most northerly of these, Asset **[A120]** is the location of a house called 'Myrtle Villas', constructed at some point between 1907 and 1932. The building is also present on maps of 1968 but gone by 1975. The site of the building lies 25 m to the east of the VPI Site. Asset **[104]**, is the site of a Christian Mission Room. Constructed in 1910 and present on the 1968 map, but gone by 1975. This building was located 35 m to the east of the VPI Site. Near to this is the location of a day school and school house **[A105]**, constructed at some point between 1907 and 1932. The school is also present on the 1968 map but gone by 1975. The school was located 70 m to the south-east of the VPI Site.
- 12.4.106 The site of a village hall (built 1887, **[A119]**) is now a roundabout in South Killingholme 135 m to the west of the Phillips 66 Site.
- 12.4.107 Seen for the first time in the 1932 map, but gone by the 1968 map, asset **[A110]** was a chapel which sat on the east side of Rosper Road, within the proposed VPI Site.
- 12.4.108 The (extant) Humber commercial railway line is recorded as asset **[A100]**. Sections of the (now redundant) Barton to Immingham light railway and the location of the now demolished Killingholme station along this line, are recorded as assets **[A100]**, **[A103]**, **[A118]** and **[A106]**.
- 12.4.109 The remaining assets consist of the location of a terraced house (Marsh Row) **[A99]**, built between 1905-1932 and demolished by 1975, c. 380 m to the east of the VPI Site and a geophysical anomaly discovered to be a modern service trench during an evaluation in 2006 (**[A96]**).
- 12.4.110 Asset **[A122]** relates to what may be the maximum extent of the foreshore in this region. Various pieces of work over the last two decades have surveyed this area, and when mapped the deposits give an approximate indication of where the foreshore may have been during the late Roman/ early Saxon period, before it began to recede. This is significant as the work appears to demonstrate that at section of this foreshore may be present within the bounds of the VPI Site.

### Undated

- 12.4.111 There 16 non-designated assets of an unknown or uncertain date within the 1 km study area, assets **[A119 – A134]**. In the main these relate to cropmarks or other earthworks noted through aerial, LiDAR or geophysical survey. Only two of these assets have any potential importance due to their proximity to the Proposed Developments.
- 12.4.112 **[A128]** is a tentative geophysical anomaly identified in 2009, sat between Humber Road and Rosper Road 16 m to the south-west of the VPI Site. **[A129]** was noted as a (undated) linear feature in an evaluation of 2002 (**[E84]**) but seen to be possibly part of a larger square enclosure by aerial mapping in 2009. The feature sits within the VPI Site and is likely part of the Iron Age/ Roman site present here – **[A20]**.

## Built Heritage

### Designated Parks and Gardens

- 12.1.1 One designated Park and Garden is included within the 5 km study area. Brocklesby Park (NHLE 1000971) grade I [RPG1] is located 3.5 km from the VPI Site boundary at its most northerly point. The Park was first landscaped in 1603 when Sir William Pelham established a house at Brocklesby. Much of the grounds, follies and structures were laid out by Baron Yarborough on return from his Grand Tour in the 18th century. These schemes include the works of Capability Brown, Thomas White and Jeffrey Wyattville. New gardens were laid out by Reginald Bloomfield in 1898 and again in 1891. Brocklesby Hall remains the principal building of the park, others include a monumental mausoleum, stable ranges, gate lodges and an estate office. Gardens and pleasure grounds include sunken gardens, a formal lake, lawns, bowling greens and arable parkland. The setting of Brocklesby Park comprises the Brocklesby Estate and the villages of Brocklesby and Limber, and does not extend to include the Sites, located approximately 3.5 km away. The architectural and historic interest of the park lies in the multiple phases of landscaping by influential architects and the volume of listed structures for which the park provides an effective setting.

### Conservation Areas

- 12.1.2 There are no conservation areas within the 5 km study area.

### Listed Buildings

- 12.1.3 The 5 km study areas contains a total of thirty-three listed buildings, four of which are located within 1 km of the Sites [BH7, BH21-22 & BH33].
- 12.1.4 The Church of St Denys [BH7] (NHLE: 1103701) is a grade I parish church located approximately 930 m north-west of the Phillips 66 Site. The Church dates to the 12th century with multiple phases of extension and alteration throughout the Medieval, post-Medieval and modern periods. The Church is constructed in squared limestone, ironstone and chalk, chalk rubble and flint and has 18th century slate roofs. The immediate setting of the Church is defined by the churchyard which has by a low-hedge boundary with a stone arch gateway. T, the wider setting extending to include views between the Church and the historic parish of North Killingholme. The Churchyard is slightly elevated, enhancing the visual prominence of the Church as the tower can be viewed from various points throughout the village. The significance of the Church lies in its archaeological interest as a structure which contains 12th, 13th and 14th century fabric, with later phases of alterations. The architectural interest lies in its architectural detailing with historic interest in the church's role as the centre of religious and administrative life within the parish of North Killingholme during the Medieval and post-Medieval periods.
- 12.1.5 The Old Vicarage [BH33] (NHLE: 1214966) is a grade II former vicarage, now a private residence, located approximately 950 m from the Phillips 66 Site. The asset comprises two storeys plus attics in yellow brick on an L shape plan with pitched slate roof. The architectural interest of the Old Vicarage lies in the range of decorative features including stucco plait band, Doric doorcase and stucco window arches and projecting sills. The historic interest of the Old Vicarage lies in the former functional relationship with the Church of St Denys [BH7].
- 12.1.6 The Nook [BH21] (NHLE: 1215113) is a grade II house located approximately 450 m west of the Phillips 66 Site. The house is dated to the 17th century, extended during the 19th century with the addition of a 20th century porch. The Nook comprises of one and a half storeys in white-washed brick with a pitched pantile roof with rendered brick chimney stacks and a projecting dormer. . The Nook is on a north-south alignment with the gable-end facing the road, suggesting it pre-dates the current layout of the road. The architectural interest lies in the largely unaltered vernacular construction methods and materials.
- 12.1.7 The Baptist Chapel [BH22] (NHLE: 1346858) is a grade II former Chapel located approximately 570 m south of the Phillips 66 Site. The Chapel is dated 1792 with 19th and 20<sup>th</sup> century alteration and restorative works. It is constructed on a rectangular plan in red brick with a pitched pantile roof. The Chapel has one storey plus attics, the interior contains a now boarded over baptismal tank. The Baptist Chapel gives its name to the street 'Baptist

Chapel Lane', however is now obscured from the public highway by foliage and appears to be in a state of dereliction. The historic interest of the structure lies in its historic religious function, which is evidenced by the survival of the baptismal tank although not evident from the exterior in its current state.

- 12.1.8 Of the remaining 29 listed buildings identified within the extended 5 km study area, a total of five are designated grade I and a further two are designated grade II\*. As these assets are all considered to be of high value, a summary of their setting and significance is included below. The remaining 24 assets have been scoped out of this assessment as they are sufficiently distant from the Sites that they do not contribute to their setting or significance.
- 12.1.9 Thornton Abbey gatehouse and wing walls, precinct walls and barbican **[BH1]** (NHLE: 1346859) grade I and grade I remains of Thornton Abbey **[BH4]** (NHLE:1215139) are located approximately 4.3 km north of the Phillips 66 Site. The assets listing comprises the gatehouse, sections of the precinct walls and barbican associated with the ruins of Thornton Abbey. The Abbey was founded as a Priory in 1139, the ruins now comprising of late 12th or early 13th century dormitory vault, largely rebuilt mid-13th and late 14th century. The structures are of considerable archaeological interest derived from the survival of original medieval materials and partially extant structures, including 14th century material in the gatehouse for Abbot Thomas Gresham and the 15th century barbican. The historic interest stems from the historic religious and political influence of Thornton Abbey as a monastic institution as a whole. There is also significant architectural interest in the gatehouse, as one of the largest and most richly ornamented examples in England.
- 12.1.10 Abbot's lodge **[BH9]** (NHLE: 1103713) grade I, is located approximately 4.3 km from the Phillips 66 Site. The asset is a 17th century house by Sir Vincent Skinner which incorporates materials from and the former monastic range of Thornton Abbey which date to the 13th and 14th centuries. The house has archaeological interest stemming from the reuse of medieval masonry. The historic interest stems from the historic religious and political influence of Thornton Abbey as a monastic institution as a group of assets. Architectural interest lies in the complex range of architectural detailing from various periods including the Tudor arch inserted in the ground floor.
- 12.1.11 The Church of St Andrew **[BH6]** (NHLE: 1310011) grade I, is located approximately 1.7 km south of the Phillips 66 Site. The Parish Church was established in the 11th or 12th century with the nave surviving from this period. The majority of the Church is later Medieval with 19th and 20th century restorations. The immediate setting of the Church is the churchyard which contains a Medieval cross base **[BH5]**. The wider setting extending to include the parish of Immingham, however views between the Church and parish are currently obscured by the tall foliage and mature trees along the boundary of the churchyard. The significance of the Church lies in its archaeological interest as a structure which contains 12th and 13th century fabric. The architectural interest lies within the Church's fine masonry in its architectural detailing. The historic interest lies in the church's role as the centre of religious and administrative life within the parish of Immingham during the Medieval and post-Medieval periods.
- 12.1.12 The Church of St Peter **[BH10]** (NHLE: 1103729) grade I, is located approximately 1.9 km north of the Phillips 66 Site. The Church dates to the 14th century, reusing some earlier sections of 12th and 13th century sections of masonry and was subject to with an extensive scheme of restoration in the mid-19th century by J. Fowler The immediate setting of the Church is comprised by the churchyard. The wider setting of the asset extends to include the surrounding parish of Townside, East Halton although views of the Church are limited by the reduced height of the tower and screening from mature foliage and trees. The significance of the Church lies in its archaeological interest as a structure which contains 12th, 13th and 14th century fabric. The architectural interest lies in its architectural detailing. The historic interest lies in the church's role as the centre of religious and administrative life within the parish during the medieval and post-medieval periods.
- 12.1.13 Manor Farmhouse **[BH19]** (NHLE: 1346854) grade II\* is located approximately 1.2 km from the VPI Site. The farmhouse is constructed on an L shape plan in brick with a pantile roof, dated to the 16th century with a 17th century extension and 19th century porch. Manor Farmhouse is located on an island within a moated site **[A43]** from which archaeological interest is derived and forms a group of assets alongside **[BH20]** stables/ granary. The historic

interest lies in the agricultural function of the farmhouse, evident in the setting of agricultural land.

- 12.1.14 Newsham Lodge **[BH26]** (NHLE: 1166070) grade II\*, is located approximately 4.7 km south-east of the Phillips 66 Site The gate lodge dates to the 19th century and features an arched gateway and a two and three storey faceted tower in ashlar. Newsham Lodge is located within Brocklesby Park **[RPG1]**, the context of the parkland and the monuments and structures including Brocklesby Hall (NHLE 1359800) grade I which fall outside of the 5 km study area, form the context of the asset. The architectural interest of the lodge lies in the Gothic style and decorative features by J. Wyattville, as well as in the role of the lodge as a highly effective entranceway to the **[RPG1]**. The historic interest of Newsham Lodge is derived from association with the parkland influenced by the Grand Tour of Baron Yarborough.
- 12.1.15 Newsham Bridge **[BH27]** (NHLE: 1063419) grade I, is located approximately 3.8 km south-west of the Phillips 66 Site The bridge is located within Brocklesby Park **[RPG1]** over Newsham Lake and is attributed to Capability Brown, circa 1772. The bridge comprises of seven unequal ashlar arches in the Romanesque style, also referring stylistically to the 14th century to pay homage to the nearby monastic site. Statues depicting religious figures is also used to make associations with historic monasteries. The architectural interest of the bridge lies in the fine masonry detailing and sculpture and association with landscape architect Lancelot Capability Brown.

### Non-Designated Buildings

- 12.1.16 No non-designated built heritage assets have been located either on or within the Sites. A total of 16 non-designated buildings have been identified within the 1 km study area, comprising of two non-conformist chapels, a school, a monument and thirteen historic farms.
- 12.1.17 Killingholme Primary School **[BH36]** (MLS22326) is a school located approximately 750 m west of the Phillips 66 Site within a built-up suburban area. The school has two storeys on a 'C' shape plan with gables facing the street in red brick with a pitched slate roof. The gables have decorative timber bargeboards and ribbed arches above modern sash windows. The setting of the asset is considered to comprise of the school playing fields and surrounding residential area. The school has architectural interest in its decorative features, typical of a late 19th century school building and is considered to be of local significance.
- 12.1.18 A number of non-designated agricultural buildings and farmsteads **[BH37-BH49]** have been identified within the 1 km study area across North and South Killingholme, some are still in use as working farms whilst others have been converted for private residential use. These agricultural structures have historic interest relating to the historic landscape character type 'Fields and Enclosed Land' and subtypes 'Ancient Enclosure' and 'Modern Fields'. The assets have the potential to yield information about post-medieval agricultural practices.
- 12.1.19 A memorial stone **[BH50]** is located approximately 930 m north-west of the Phillips 66 Site within the churchyard of the Church of St Denys, North Killingholme. The memorial stone commemorated the men of the parish who died in service during the First and Second World Wars collectively, a roll of honour is located inside of the Church. The stone has communal interest as a memorial to local casualties of war.

## **Previous Ground and Archaeological Investigations**

### Previous Ground Investigations – VPI Site

- 12.4.113 The northern half of the VPI Site has been industrially developed as the VPI Immingham CHP Plant and the ground underneath was heavily disturbed as part of these works. The southern half of the VPI Site appears to be open, undisturbed, land.
- 12.4.114 A bore hole survey conducted in 2000 by Humber Field Archaeology (Buglass and Bradley, 2006), **[E101]**, placed two borehole transects (runs 1 and 2), through the open scrubland area of the VPI Site, which extended to a depth of c. 3.5 m. Run 1 was placed along what a prior geophysical survey had tentatively identified as a silted up palaeochannel whilst run two was placed along what appear to be the mouth or tidal inlet of the same channel in order to try and establish the ancient shoreline. Run 1 was successful in identifying and characterising width

of the channel and the sediments within appearing to demonstrate that the foreshore sands were present on the edge of the palaeochannel at depth of c. 0.50 m. This deposit was c. 0.25 m thick and overlay clay sediments interpreted as glacial washout. Run 2 also identified the inlet mouth and the more complex sequence of sediments associated with this. There appeared to be a number of phases of sediment deposition and erosion (as would be expected at a tidal inlet), the sediments associated with this beginning at a depth of c. 0.70 m and continuing to a depth of c 1.5 m. Towards the edge of run 2, the foreshore sands were seen at a depth of c. 0.35 m.

12.4.115 This work demonstrates that:

- 1) The foreshore appears to extend into the VPI Site; and
- 2) The southern half of the VPI Site appears to be (largely) undisturbed by modern intrusions or work which may have damaged any below ground archaeological assets.

12.4.116 Allen Archaeology (Rackham and Clay, 2013 and 2016) conducted a palaeoenvironmental survey (borehole survey) on land immediately to the east of the VPI Site in 2013 (**[E126]**), which was then extended in 2016 (not yet in the HER data). Two of the transects excavated, E and C come within 120 m of the eastern edge of the VPI Site. The paleo soils recovered by this work were able to, broadly, map the western most extent of the foreshore and demonstrate periods of inundation and regression, followed by a final inundation in the Roman period and subsequent gradual regression. The work concluded that pre-Iron Age deposits may be encountered towards the eastern extent of the transects (the modern shoreline), buried under alluvium at a depth of 1-2 m but that later archaeological remains (Iron Age – Roman) would likely only be encountered towards the western end of the transects due to a combination of erosion during periods of indication and regression and the general inaccessibility of the more easterly areas at these times due to flooding. The land would have been marsh during the Medieval period.

12.4.117 These two pieces of work formed the basis for the mapping of the foreshore, detailed as **[A122]**.

### Previous Archaeological Works - VPI Site

12.4.118 A narrow strip along the open area of the VPI Site (to the immediate south of the Immingham CHP Plant) has been previously developed – areas of concrete, gravel and other ‘hand standing’ material being laid down. The remainder of the VPI Site is undeveloped open scrub land although part of it was used as a construction laydown area during construction of the existing CHP plant.

12.4.119 Previous archaeological work within the VPI Site has largely been associated with the construction of the existing CHP plant , and includes:

- the land was part of a larger aerial photographic survey in 1989 **[E1]** and 2009 **[E93]**;
- a field walking exercise carried out in 1999 which collected a number of Iron Age and Roman artefacts **[E87]**. This was followed by a geophysical survey **[E88]**;
- following on from the above, series of excavation were carried out in the central area of the VPI Site in advance of the construction of the VPI Immingham CHP plant, between 1999 and 2002. This work identified an Iron Settlement consisting of several round houses and other features associated with an ancient creek identified by the below borehole survey, this settlement appearing to extend into the Roman period **[E83]**, **[E84]**, **[A20]**. The remains were further encountered and recorded in a later watching brief **[E6]**;
- a borehole survey was carried out as part of the excavations in 2002, which identified foreshore deposits and a paleochannel which was connected to the River Humber **[E101]**;
- a LiDAR topographic survey carried out between 1998 – 2006 (**[E72-E79]**);
- a watching brief carried out in 2007 towards the east edge of the VPI Site, which did not identify any archaeological finds or features **[E85]**; and

- a geophysical survey was carried out in the south-east quadrant of the VPI Site in 2009 which identified a number of possible archaeological anomalies [E95];

### Previous Ground Investigations – Phillips 66 Site

12.4.120 There is, unfortunately, no work which provides any evidence for the presence/ extent of ground disturbance at the Phillips 66 Site. However, given the date that the Humber Refinery was constructed (1966) and the heavily industrialised nature of the Refinery site it is very likely that there has been significant ground disturbance of the Phillips 66 Site. This, combined with the relatively shallow depth of archaeological remains at nearby sites (e.g. noted at a c.0.30 m during the archaeological excavations in the neighbouring VPI Site, [A20]) means that it likely that very little survives, in term of below ground archaeological assets, within the Phillips 66 Site.

12.4.121 It is notable that a small area on the western edge of the Phillips 66 Site appear to be undisturbed, or at least has not been industrially developed.

### Previous Archaeological Works - Phillips 66 Site

12.4.122 The Phillips 66 Site has been previously heavily developed. There are no recorded, intrusive archaeological investigations within the bounds of the Phillips 66 Site. Previous work within the Site has been limited to non-intrusive surveys including aerial photographic surveys carried out in 1989 and 2009, [E1] and [E93] and a gradiometer survey in 2007 which did not identify any clear archaeological activity, [E81].

## **Archaeological Potential**

12.4.123 This section assesses the potential for unrecorded buried archaeological remains and surface artefacts to be present within the Sites. The assessment of archaeological potential is based on the data available at the time of writing and takes into consideration the known archaeological assets within the Sites and study areas, and the historical and cartographic evidence presented in the baseline. The lack of instances of particular archaeological periods within the Sites and study areas may reflect limited archaeological investigation to date, rather than a real absence of activity.

### Prehistoric (Palaeolithic – Neolithic)

12.4.124 The Lithic periods are relatively well represented in the region, likely due to the extensive woodlands present in Doggerland in the early/ mid parts of these periods and the marshes and coastal regions more prevalent later.

12.4.125 Whilst no Palaeolithic evidence had been recovered from within the 1 km study area, a number of Mesolithic and Neolithic finds (tool find spots) have been made in the study area and within the VPI Site itself (a Mesolithic flint scatter of over 233 pieces - [A7]). The majority of these finds – including the asset within the VPI Site - appear to sit within the ancient foreshore (as mapped by [A122]). Flint tools of a ‘prehistoric’ date were also recovered during excavations within the VPI Site, which identified an Iron Age/ Roman settlement ([A20]), in association with an ancient paleochannel.

### VPI Site

12.4.126 Given the fact that the **VPI Site** has had Mesolithic material found within it, and that the foreshore appears to extend into it the VPI Site, the potential to encounter Mesolithic or Neolithic activity is deemed to be **moderate**. If such remains were to be encountered, they would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy and subsistence/ agricultural practices.

### Phillips 66 Site

12.4.127 Photographic evidence hints that the paleochannel noted in the VPI Site may once have extended further westwards in the middle of the **Phillips 66 Site**. However, the lack of finds from within or near the Phillips 66 Site - and the likely more disturbed nature of the ground here - means that the potential to encounter Mesolithic or Neolithic activity is deemed to be

**low.** If such remains were to be encountered, they would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy and subsistence/ agricultural practices.

### Prehistoric - Bronze Age

12.4.128 Within the wider region the Bronze Age is fairly well represented, with Bronze Age settlements at the Killingholmes and East Halton (all over 2 km away). Within the 1 km study area there are a number of Bronze Age tool find spots which again appear to be associated with the foreshore. However, there is also evidence for a possible Bronze Age occupation site (again within the foreshore) 260 m south-east of the VPI Site ([A11], [A12] & [A13]).

#### **VPI Site**

12.4.129 Given the proximity of the possible Bronze Age settlement to the VPI Site, along with the presence of the foreshore within the bounds of the VPI Site and possible Bronze Age material recovered from [A20], the potential to encounter remains of this date at the VPI Site is deemed to be **moderate**. If such remains were to be encountered they would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on their capacity to inform on the to inform on the nature of and variations local cultural assemblages as well as the economy, industry, and subsistence/ agricultural practices of the period.

#### **Phillips 66 Site**

12.4.130 A single flint tool, [A24], was recovered from within the bounds of the Phillips 66 Site, prior to the construction of the Refinery and may be associated with the possible paleochannel within this area. The potential presence of a paleochannel within the Phillips 66 Site (and the attendant depths of alluvium) means that there is a possibility that archaeological material may be present at depth below the Refinery. However it is as, if not more, likely that the single tool recovered was transported from the VPI Site where a far more significant flint assemblage is present. This combined with the lack of any other evidence from the Phillips 66 Site and the likelihood of substantial ground disturbance means that the potential to encounter remains of this date at the Phillips 66 Site is deemed to be **low**. If such remains were to be encountered they would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on their capacity to inform on the to inform on the nature of and variations local cultural assemblages as well as the economy, industry, and subsistence/ agricultural practices of the period.

### Iron Age

12.4.131 The Iron Age period is also well represented in this region with the areas around East Halton, North Killingholme and slightly further afield, Kirmington all being centres of Iron Age occupation. There is also substantial Iron Age presence within the 1 km study area, with settlement sites ([A16], [A17], [A18]) being clustered to the east of the VPI Site along the edge of the ancient foreshore - as predicted by Rackham and Clay (2013 and 2016) . Crop marks to the north ([A15] & [A19]) and south ([A26]) of the VPI Site (also just beyond the foreshore) may be indicative of further Iron Age settlement and/ or field systems.

12.4.132 More significantly a known Iron Age settlement site, [A20], is present within the bounds of the VPI Site itself. Whilst crop marks see in aerial photographs from 1958, hint at the presence of Iron Age use of the Phillips 66 Site.

#### **VPI Site**

12.4.133 The presence of a substantial Iron Age settlement within the bounds of the VPI Site, the limits of which have not been completely defined by previous work ([E83] & [E84]) as well as possible Iron Age activity around its edge, which may extend into the VPI Site – particularly asset [A16] - means that the potential to encounter remains of this date within the VPI Site is deemed to be **high**. Any remains encountered, of this period would be deemed to be of **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy, industry, trade, agricultural practices and local communication networks.

### **Phillips 66 Site**

12.4.134 Whilst aerial photography indicates that Iron Age activity may have been present with middle of the Phillips 66 Site (**[A25]**, possible rectilinear enclosures) this asset was noted prior to the construction of the Refinery and has not been seen by any aerial photographic surveys since – being covered in industrial buildings as the Refinery now is. The archaeological work within the VPI Site demonstrated that the Iron Age / Roman archaeological horizon sits at c. 0.30 m below ground level. This relatively shallow depth for the archaeological horizon, combined with the likelihood of significant ground disturbance within most of the bounds of the Phillips 66 Site, means that the potential to encounter remains of this date within the Phillips 66 Site is deemed to be **low**. However, any remains encountered, of this period would be deemed to be of **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy, industry, trade, agricultural practices and local communication networks.

### **Roman**

12.4.135 The Roman use of the region largely represents a continuation of the sites established during the Iron Age, with many expanding and new sites developing around them.

12.4.136 This pattern is reflected in the study area. The previously mentioned Iron Age sites continue in use and many appear to become more complex, whilst new settlement sites such as **[A35]**, **[A36]** and **[A37]** appear.

### **VPI Site**

12.4.137 Asset **[A20]** within the VPI Site continues in use during this period, becoming more complex and increasing in status, as does **[A16]** just to south-east of the VPI Site. Roman field enclosure ditches (**[A38]**) possibly associated with **[A20]** also appear, adjacent to the eastern edge of the VPI Site. As a result, the potential to encounter remains of this date within the VPI Site is deemed to be **high**. Any remains encountered, of this period would be deemed to be of **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy, industry, trade, agricultural practices and local communication networks.

### **Phillips 66 Site**

12.4.138 A single Roman pottery sherd, **[A24]**, was recovered from within what is now the developed area of the Phillips 66 Site, prior to the construction of the Refinery. Whilst this may be associated with crop mark **[A25]**, is more likely that it was transported from the VPI Site. Asset **[A36]** is a Roman settlement (identified via archaeological investigation) 330 m to the north west of the western edge of the Phillips 66 Site – at this distance it is unlikely that remains of this settlement extend into the western edge of Phillips 66 Site, certainly no finds have been made to hint at this. This, combined with the lack of any other evidence from the Site and the likelihood of substantial ground disturbance means that the potential to encounter remains of this date at the Phillips 66 Site is deemed to be **low**. Any remains encountered, of this period would be deemed to be of **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy, industry, trade, agricultural practices and local communication networks.

### **Early Medieval**

12.4.139 There is relatively little evidence for the Saxon period within the wider region, although there is some evidence that Roman sites at Goxhill, East Halton and Kirmington some at least some level of continuation into this period.

12.4.140 Again, this pattern is reflected within the study area. Asset **[A17]** may continue in use into this period and moated site **[A40]** may represent continued occupation of the Killingholme area. There is no evidence for Saxon use of either of the Sites – asset **[A20]** appears to fall out of use towards the end of the 3<sup>rd</sup> century AD as does asset **[A16]**.

### **VPI Site**

12.4.141 Whilst it is not impossible that the earlier settlement sites, and field systems, seen in and around the VPI Site continue into this period, there is no direct evidence for this. Accordingly, the potential to encounter remains of this date within the VPI Site is deemed to be **low**. The remains likely to be encountered would be considered of **local** and **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on early medieval society, economy, agricultural practices and the changes in the landscape from early medieval to modern times (growth and shrinkage of settlements, for instance).

### **Phillips 66 Site**

12.4.142 It is possible that the moated site to the west of the Phillips 66 Site ([A40]) was associated with a wider farmstead and/ or field system which extended far enough west to encroach upon the western edge of the Phillips 66 Site. It is also notable that a small section to the extreme west of the Phillips 66 Site appears to be undisturbed. However, there is no evidence for such activity in this small area and this, combined with the likelihood of substantial ground disturbance across the rest of the Phillips 66 Site, means that the potential to encounter remains of this date at the Phillips 66 Site is deemed to be **low**. The remains likely to be encountered would be considered of **local** and **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on early medieval society, economy, agricultural practices and the changes in the landscape from early medieval to modern times (growth and shrinkage of settlements, for instance).

### **Medieval**

12.4.143 During this period the immediate region of the Proposed Developments would have been dominated by a row of villages and farmsteads running north to south from East Halton to South Killingholme, along a spine road – the evidence for this encompassing a number of earthwork sites including five designated assets. The pre-enclosure land around these villages was dominated by a ridge and furrow plough regime as evidenced in the relict earth work remains of these ([A52], [A53], [A58], [A59], [A60], and [A61]) with field boundaries being defined by ditches ([A66], [A67], and [A68]).

### **VPI Site**

12.4.144 There is no indication of any medieval settlement activity within the immediate vicinity of the VPI Site, indeed the land to the east of the VPI Site would have been marsh land at this time. However, there is substantial ridge and furrow activity ([A53]) recorded in and around the VPI Site. As a result, the potential to encounter remains of this date within the VPI Site is deemed to be **high**. The remains likely to be encountered would be considered of **local** and **archaeological** and **historical interest** and **medium value** based on their capacity to inform on medieval society, economy, agricultural practices and the changes in the medieval landscape from medieval to modern times (shrinkage of medieval settlements, for instance).

### **Phillips 66 Site**

12.4.145 Sections of the East Halton to South Killingholme row villages ([A40], [A62] and [A63]) sit within 200 m of the Phillips 66 Site, and it is possible that elements of these villages and their surrounding field system may have once sat on the Phillips 66 Site. Indeed, ridge and furrow activity - [A53] is, theoretically, mapped as having extended into the Phillips 66 Site at one time. However, this activity is no longer visible (due to the industrial nature of the Refinery site) and it is likely that this industrial development has removed all traces of this activity of this period, ridge and furrow or otherwise. However, a small section to the extreme west of the Phillips 66 Site appears to be undisturbed and it is possible that elements of the villages/ associated field systems may be preserved here. Accordingly, the potential to encounter remains of this date within the Phillips 66 Site is deemed to be **moderate**. The remains likely to be encountered would be considered of **regional** and **archaeological** and **historical interest** and **medium value** based on their capacity to inform on medieval society, economy, agricultural practices and the changes in the medieval landscape from medieval to modern times (shrinkage of medieval settlements, for instance).

### Post Medieval

- 12.4.146 The region of the Proposed Developments sees the row of villages between East Halton shrink and nucleate and a number of now demolished 19<sup>th</sup> century farmhouses are scattered around the study area. At some point between the initial enclosure of the fields around the Sites in 1776 and the production of the first OS map in 1887 the fields system is re-organised and many of these field boundaries are still visible as earthworks, cropmarks or extant hedgerows today.
- 12.4.147 Both the post enclosure map, and the OS map of 1887 demonstrate that the Sites would have been crossed by a number of field boundaries.

### VPI Site

- 12.4.148 Within the **VPI Site** it is likely that elements of these field boundaries may still be preserved, **[A72]** is a crop mark which appears to be a linear ditch that aligns with field boundaries seen on the 1887 map, and which sits within the bounds of the site (towards its, undisturbed, central/ southern end). Assets **[A70]** and **[A71]** include elements of a historically important hedgerow that is also recognised as aligning with a boundary on the pre 1840 maps, and which forms part of the south-eastern boundary of the VPI Site. The below ground element of this archaeological asset (a boundary ditch) is being considered here. These below ground remains should be considered of **local archaeological** and **historical interest** and **low** value based on their capacity to inform on post medieval society, economy, agricultural practices and changes in the medieval/ post medieval landscape.
- 12.4.149 For these reasons the potential for encountering remains of this date at the VPI Site is deemed to be **high**. Such remains would be considered of **local archaeological** and **historical interest** and **low** value based on their capacity to inform on Post Medieval society, economy, agricultural practices and changes in the medieval/ post medieval landscape.

### Phillips 66 Site

- 12.4.150 The 1887 map indicates that a number of field boundaries would once have run through what is now the Phillips 66 Humber Refinery site, including a single boundary running north – south through the apparently undisturbed western section of the Phillips 66 Site. Whilst there is no evidence for this boundary being present it is certainly possible. For this reason, the potential for encountering remains of this date at the Phillips 66 Site is deemed to be **moderate**. Such remains would be considered of **local archaeological** and **historical interest** and **low** value based on their capacity to inform on post medieval society, economy, agricultural practices and changes in the medieval / post medieval landscape.

### Modern

- 12.4.151 The area of the Proposed Developments changes significantly in the modern era, road and rail develop in the area and the region becomes heavily industrialised – including significant industrial development at both sites.
- 12.4.152 However, this modern development is relatively well understood in terms of its extent – the area of the Proposed Developments which have been, and have not been, affected by it. Accordingly, the potential for discovering *unknown* archaeological assets of this date is deemed to be **negligible** for both Sites. Such remains would be considered of **local archaeological** and **historical interest** and **low value**, due to their ability to inform on 19<sup>th</sup> – 20<sup>th</sup> century development of the Sites.

### Paleoenvironmental Archaeological Assets

- 12.4.153 As previously noted, it appears that evidence for the ancient foreshore extends into the VPI Site and may, theoretically, even extend into the Phillips 66 Site. This asset – the deposits associated with the ancient foreshore and any intersecting paleochannels - are worthy of their own assessment here as they have the potential to contain significant paleoenvironmental data from multiple periods - from the Palaeolithic through to the Early Medieval.
- 12.4.154 Such deposits, wherever they are encountered, would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on their capacity to inform on past

environments and agricultural practices and their ability to demonstrate how these changed over time.

## **Future Baseline**

12.4.155 A review has been undertaken to determine how or whether the existing baseline conditions might change if the Proposed Developments did not take place and thus considers other planned developments within the bounds of the Proposed Developments.

12.4.156 Consideration was given to the following development-related changes that could potentially alter the historic environment in the future:

- 1) The partial or total loss of known or potential buried archaeological resources within the Sites or known above-ground assets within the study area as a consequence of land being disturbed or developed.
- 2) Changes to the sensitivity (value) and significance of assets within the study area through the introduction of new development in their setting.

12.4.157 The review evaluated the other planned development projects summarised in Chapter 18: Cumulative and Combined Effects (ES Volume I) and involved:

- 1) The identification of any permitted (i.e., consented) projects within the assessment study area that have yet to be implemented;
- 2) Analysis of the likely environmental effects and planned timescales for each identified project;
- 3) An assessment of the potential for each identified project to change the existing baseline conditions in the Construction Years (2023 – 2027) and the subsequent operational periods of the Proposed Developments, in the manner described above.

### **VPI Site**

12.4.158 Although a small number of the other development projects are expected to form part of, and influence, the future baseline conditions of the study area the review concluded that there would be no material change to the form, character and appearance of the historic environment in the future assessment years.

12.4.159 Accordingly, the assessment presented in Section 12.6 assesses the impacts of the Proposed VPI Development against the existing baseline conditions at the VPI Site.

### **Phillips 66 Site**

12.4.160 Although a small number of the other development projects are expected to form part of, and influence, the future baseline conditions of the study area as a result, the review concluded that there would be no material change to the form, character and appearance of the historic environment in the future assessment years.

12.4.161 Accordingly, the assessment presented in Section 12.6 assesses the impacts of the Proposed Phillips 66 Development against the existing baseline conditions at the Phillips 66 Site .

## **12.5 Development Design and Impact Avoidance**

### **Mitigation by Design**

12.5.1 Where possible embedded mitigation measures, or mitigation by design, has been incorporated into the design of the Proposed Developments. For this development the integrated heritage measures include consists of a programme of archaeological evaluations:

### **VPI Site**

12.5.2 A programme of geotechnical survey was undertaken across suitable areas of the VPI Site in October 2022. This work was monitored by archaeologists, who also had access to the work

logs and cores. The purpose of this was to understand the deposit sequence across the site, the potential for the preservation of archaeological remains and where these might be located, and the palaeoenvironment of the site – with particular reference to the nature and extent of alluvial deposits associated with the nearby foreshore and any ancient tributaries (palaeochannels) which flowed into this. The work consisted of four boreholes and 19 cable percussion tests (CPT).

- 12.5.3 The results of this work are presented in Appendix 12C. No archaeological features or finds were observed by the works - although this is possibly due more to the nature of the work (small boreholes and cable percussion tests) and the restrictions this type of works place on observation, rather than genuine absence. Depths of alluvium (extending from c.0.30 m below ground level to >1 m below ground level) were noted across much of the VPI Site, reflecting its foreshore location. This alluvium appeared particularly prevalent within the centre and eastern edge of the VPI Site. Again, this is unsurprising given the foreshore location of the VPI Site and the presence of the palaeochannel believed to run through the middle of it. The work also demonstrated that the central part of the VPI Site (to the immediate south of the existing VPI Immingham CHP Plant) was heavily disturbed, with large areas of made-up ground present. This appears to relate to a large laydown area created during the construction of the CHP plant.
- 12.5.4 A geophysical (magnetometer) survey was also undertaken across suitable areas of the VPI Site in October 2022 (Appendix 12B). The purpose of this was to identify anomalies within the VPI Site which may be archaeological in nature – as well as to identify areas of modern activity and geological variation. The results of this work would then be used to inform the need for, and nature of, any following intrusive archaeological works, such as trial trench evaluation.
- 12.5.5 The survey noted that a lot of ‘noise’ was present to within the central area of the VPI Site as well as around the edges of it. This appeared to relate to the areas of made-up ground associated with the construction laydown area as well as services and utilities (such as pipelines to the west of the site and electricity service cables to the east). The work also identified several anomalies which appeared to be archaeological in nature. These consisted of linear, curvilinear and (sub) circular anomalies concentrated in the centre and south part of the VPI Site, which may be indicative of archaeological remains associated with the Bronze age / Iron Age / Roman settlements known to be present within and near to the VPI Site (assets [A20] and [A11], [A12], [A13] and [A16]). Additionally, a linear anomaly possibly representative of a historic field boundary (seen in first edition Ordnance Survey maps) was noted, as were areas of signal possibly indicative of palaeochannels.
- 12.5.6 The results of this work informed the design of a trial trench evaluation and paleoenvironmental assessment within the VPI Site. This work will consist of 32 trial trenches (31 of which are 50 m x 2 m in dimensions and one of which is 65 m x 2 m) and two borehole transects. The aim of this work is to inform on the presence, extent, character and nature of any archaeological features and deposits present within the VPI Site, with particular reference to the known Bronze Age – Roman settlements and foreshore/ paleochannel deposits, as well as to confirm or refute the lack of archaeological presence within apparent archaeologically ‘blank’ areas of the VPI Site.
- 12.5.7 A Written Scheme of Investigation (WSI) for this trial trench evaluation was produced in December 2022 (Murray and Yendell, 2022) and approved by the Historic Environment Officer for NLC in January 2023. The work commenced on site in January 2023 and is ongoing at the time of writing. The results of this work (along with the non-intrusive surveys) will assist in determining the need for, and design of, any further investigative archaeological works – such as strip map and record. The need for, and design of, any further works will be determined in liaison with the Historic Environment Officer for NLC.
- 12.5.8 For the Phillips 66 Site a geotechnical survey will be undertaken, which shall be monitored by a suitable geoarchaeologist, and the data collected used to inform as to the presence/ degree of preservation, of any archaeological features and deposits surviving within the Phillips 66 Site. The results of this work will be used to determine the need for, and design of, any further archaeological works (such as test pits or trial trenches). The need for, and design of, any further works will be determined in liaison with the Historic Environment Officer for NLC.

12.5.9 This embedded mitigation for both sites, as outlined above, has been taken into account when evaluating the significance of the potential effects. Note that these embedded mitigation works consist solely of works designed to understand (evaluate) the archaeological presence at the Sites, they do not alter (offset or reduce) the magnitude of impact by themselves. Instead they inform on the need for/ nature of further actual mitigation works as detailed in Section 12.7. The residual effects described in Section 12.8 are those effects which remain, taking into account any further proposed mitigation works - such as the detailed archaeological excavation and recording of heritage assets.

## 12.6 Likely Impacts and Effects of the Proposed Developments

12.6.1 This section presents an assessment of how the Proposed Developments may result in impacts to heritage assets during the construction and operational phases.

12.6.2 Impacts to heritage assets may potentially occur as a result of the direct and permanent loss of heritage assets during construction activities, or through changes within the settings of heritage assets which may occur during the construction phase but continue through the operational lives of the Proposed Developments.

12.6.3 Temporary construction impacts lasting for all or part of the construction phase of the Proposed Developments potentially include the following:

- alteration of the setting of the assets due to visual intrusion (of the works/ elements of the works) and a potential increased noise as heard from the asset.

12.6.4 Permanent construction impacts of the Proposed Developments lasting beyond the construction phase potentially include the following:

- physical impacts on known or unknown heritage assets arising from construction activities such as earthworks excavation, the formation of construction compounds and the installation of drainage and/ or service infrastructure;
- physical impacts on landscapes of historical, cultural or archaeological significance as a consequence of construction, such as the loss of important elements of the landscape as a result of site clearance; and
- the disturbance, compaction or removal of previously unrecorded sub-surface archaeological deposits through construction activities.

12.6.5 Operational impacts of the Proposed Developments potentially include the following:

- Alteration of the setting of an asset particularly its visual setting via the intrusion of from large or tall elements of the Proposed Developments (such as stacks and other tall buildings or structures) which may be visible from nearby heritage assets – thus affecting / altering their setting. Also, such things such as a long term increase in noise as heard from the asset, which would also impact its setting.

### Assessment of Potential impacts: Construction Phase – VPI Site

#### Designated Assets (Listed Buildings, Registered Parks and Gardens and Scheduled Monuments)

12.6.6 No physical remains associated with listed buildings, registered parks and gardens or scheduled monuments exist within the VPI Site.

12.6.7 The setting of each asset has also been considered. The VPI Site is not considered to fall within the setting of any listed buildings, registered parks and gardens or scheduled monuments due to the type of asset, or the distance involved, therefore they are not considered likely to experience any temporary changes to setting as result of the presence or movement of plant or from construction activities.

- 12.6.8 Accordingly, the construction work associated with the Proposed VPI Development will have **no impact** upon these types of assets.

### **Non-Designated Assets**

#### ***Ancient Foreshore and Associated Paleochannels and Deposits [A122]***

- 12.6.9 There is evidence that the ancient foreshore and associated ancient tributaries (paleochannels) extends into the VPI Site (asset **[A122]**). This asset – the deposits associated with the ancient foreshore and any intersecting paleochannels, would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on their capacity to inform on past environments and agricultural practices and their ability to demonstrate how these changed over time.
- 12.6.10 The construction works associated with the Proposed VPI Development would remove a relatively insignificant extent of the known ancient foreshore, but up to 50% of the paleochannel which is known to run through the VPI Site. The associated reduction in our ability to understand and appreciate the asset due to the loss of archaeological material would represent a **medium** impact resulting in a **moderate adverse** effect – which would be **significant**.

#### ***Bronze Age - Roman Settlement Activity [A11], [A12], [A13] and [A16]***

- 12.6.11 Assets **[A11]**, **[A12]**, **[A13]** and **[A16]** represent a major focus of Bronze Age to Roman activity located near to the VPI Site and likely associated with asset **[A20]** (below) within the VPI Site. Located c.260 m to the south-east of the VPI Site, it is possible that below ground archaeological remains associated with these assets extend into the undisturbed, southern, part of the VPI Site. Few Bronze Age, Iron age or Roman foreshore sites have been thoroughly investigated in the region, and the number of those sites which are so long lived and non-domestic in nature is even smaller. For this reason, these assets are considered to have **regional archaeological** interest and to be of and to be of **medium value**, based on their capacity to inform on the to inform on the nature of and variations local cultural assemblages as well as the economy, industry, and subsistence/ agricultural practices of the periods.
- 12.6.12 If present, the construction works associated with the Proposed VPI Development has the potential to permanently remove up to 50% of the known extent of this asset, resulting in the erosion of our ability to understand and appreciate the asset due to the loss of archaeological material. This would represent a **medium** impact resulting in a **moderate adverse** effect – which would be **significant**.

#### ***Iron Age - Roman Settlement [A20]***

- 12.6.13 As noted above previous archaeological investigations have identified what appears to be a substantial Early Iron Age – Late Romano British settlement site under the southern section of the VPI Site. There are even hints of Bronze Age use of the area.
- 12.6.14 This is one of very few known, sites that occupy a near estuarine location and are in substantive use throughout these periods. As such it can be considered to have **regional archaeological** interest and. **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy, industry, trade, agricultural practices and local communication networks.
- 12.6.15 The construction works associated with the Proposed VPI Development would remove 60% - 100% of the known extent of this asset, resulting in the erosion of our ability to understand and appreciate the asset due to the loss of archaeological material. This would represent a **high** impact resulting in a **moderate adverse** effect – which would be **significant**.

#### ***Medieval – Post Medieval Ridge and Furrow Activity [A53]***

- 12.6.16 Geophysical survey and other mapping works have demonstrated that ridge and furrow extends across much of the area surrounding the Proposed VPI Development, likely associated with the East Halton to South Killingholme row villages (**[A40]**, **[A62]** and **[A63]**). More importantly this asset (**[A53]**) is mapped as extending into the area of the current VPI

Immingham CHP Plant and the potentially undisturbed area of the VPI Site. These remains should be considered of **local** and **archaeological** and **historical interest** and **low value** based on their capacity to inform on medieval society, economy, agricultural practices and the changes in the medieval landscape from medieval to modern times (shrinkage of medieval settlements, for instance).

- 12.6.17 The construction works associated with the Proposed VPI Development would permanently remove a relatively insignificant extent of the mapped ridge and furrow asset within the area. Thus the associated reduction in our ability to understand and appreciate the asset due to the loss of archaeological material would represent a **low** impact resulting in a **minor adverse** effect – which would **not be significant**.

#### ***Medieval/ Post Medieval Field Boundary Ditches (Noted As Crop Marks) [A72]***

- 12.6.18 Asset [A72] is a crop mark which appears to be a linear ditch that aligns with field boundaries seen on the 1887 OS map, and which sits within the bounds of the VPI Site (towards its, undisturbed, central/ southern end). Such remains would be considered of **local archaeological** and **historical interest** and **low** value based on their capacity to inform on Post Medieval society, economy, agricultural practices and changes in the medieval / post medieval landscape.

- 12.6.19 The construction works associated with the Proposed VPI Development would remove up to 50% of the known extent of this asset, resulting in the erosion of our ability to understand and appreciate the asset due to the loss of archaeological material. This would represent a **medium** impact resulting in a **minor adverse** effect – which would **not be significant**.

#### ***Historically Important Hedgerow and Associated Ditch Land Boundary [A70] and [A71]***

- 12.6.20 Assets [A70] and [A71] include elements of a historically important hedgerow that is also recognised as aligning with a boundary ditch on the pre 1840 maps, and which form the eastern boundary of the VPI Site. The assessment of impact upon the below ground archaeological asset (the boundary ditch) is being consider here. These remains should be considered of **local archaeological** and **historical interest** and **low** value based on their capacity to inform on Post Medieval society, economy, agricultural practices and changes in the medieval/ post medieval landscape.

- 12.6.21 The construction works associated with the Proposed VPI Development would remove up to 50% of the known extent of this asset, resulting in the erosion of our ability to understand and appreciate the asset due to the loss of archaeological material. This would represent a **medium** impact resulting in a **minor adverse** effect – which would **not be significant**.

#### ***Previously Unrecorded Heritage Assets***

- 12.6.22 There is potential for previously unrecorded and unmapped heritage assets to be present within areas of the VPI Site that have not been disturbed significantly by former land-uses. The baseline assessment has identified the presence of and potential for previously unrecorded heritage assets within the VPI Site following a programme of evaluation.

- 12.6.23 The presence of early prehistoric activity associated with the ancient foreshore suggests a possibility for features, finds and deposits of this date to be present at the VPI Site. Bronze Age - Roman settlement activity nearby means that there is the potential for remains associated with this activity to also be present within the VPI Site. The site also exists within a wider landscape of medieval settlement and agricultural activity (associated with the Medieval ribbon villages of North and South Killingholme) and therefore there is potential that remains of this date - field boundaries, out buildings etc may be present within the VPI Site. The archaeological evidence associated with these periods would likely be of **regional archaeological** and **historical interest** and **medium** heritage value. The scale and spatial extent of construction activities, which would likely result in the total removal of archaeological remains that may be present, resulting in a total loss of heritage value. This would constitute a **high** magnitude of impact, resulting in a **major adverse** effect, which is **significant** upon any of these assets which may be present

### ***Historic Landscape Characterisation***

- 12.6.24 The historic landscape will be physically impacted by the Proposed VPI Development. The northern half of the VPI Site lies within the North Lincolnshire Historic Landscape Character (NLHLC) subtype 'Chemical Works' (modern) (North Lincolnshire Council 20210). The Proposed VPI Development will not alter this characterisation and so is deemed to have a **neutral** effect.
- 12.6.25 The southern half of the VPI Site falls within NLHLC subtype 'modern fields' (modern). The Proposed VPI Development will alter this element of this sites landscape making it more industrial in nature (as with the area to the north of the VPI Site, the VPI Immingham CHP Plant). The magnitude of impact is considered to be **medium**, on an asset of **local historical** interest and **very low** heritage value, resulting in a **minor** adverse effect, which is **not significant**.
- 12.6.26 In addition, the region of and around the Proposed VPI Development was also part of the Lincolnshire Historic Landscape Characterisation Project (Lincolnshire County Council 2022). This characterised the area of the Proposed VPI Development as NOM2: The Northern Marshes (Immingham Costal Marshes). This is broadly defined as a zone dominated by industrial activity (comprising 36% of the character zone) and which, prior to enclosure in the 18<sup>th</sup> century, was mainly comprised of saltmarsh grazing land. The zone is largely modern in character although historic elements can still be identified in the landscape. The Proposed VPI Development will not alter this assessment and as a result is deemed to have a **neutral** effect.

### **Assessment of Potential impacts: Construction Phase – Phillips 66 Site**

#### **Designated Assets (Listed Buildings, Registered Parks and Gardens and Scheduled Monuments)**

- 12.6.27 No physical remains associated with designated assets of any sort exist within the Phillips 66 Site.
- 12.6.28 The setting of each asset has also been considered. The Phillips 66 Site is not considered to fall within the setting of any listed buildings, registered parks and gardens or scheduled monuments due to the type of asset, or the distance involved, therefore they are not considered likely to experience any temporary changes to setting as result of the presence or movement of plant or from construction activities. Accordingly, the construction work associated with this element of the Phillips 66 Site will have **no impact** upon these types of assets.

#### **Non-Designated Archaeological Assets**

##### ***Paleochannel and Deposits Associated with the Ancient Foreshore [A122]***

- 12.6.29 Is it possible that the ancient tributary (paleochannel) associated with the ancient foreshore (see above) extends into the Phillips 66 Site. However, it is again likely that at this location this asset has been previously removed by the construction works associated with the extant Humber Refinery. As such the potential to encounter these remains is considered to be low. If it is seen to survive within the Phillips 66 site, the asset would be deemed to be of **local** and **regional archaeological interest** and of **medium value** based on its capacity to inform on past environments and agricultural practices and its ability to demonstrate how these changed over time.
- 12.6.30 If present, the construction works associated with the Phillips 66 Site may remove up to 50% of the paleochannel along its predicated line through the Phillips 66 Site. The associated reduction in our ability to understand and appreciate the asset due to the loss of archaeological material would represent a **medium** magnitude impact, resulting in a **moderate adverse** effect – which would be **significant**.

### ***Rectilinear Crop Mark [A25]***

- 12.6.31 Asset [A25] is another crop mark site identified in aerial photographs dated in 1958. The asset consists of a rectilinear enclosure measuring c.30 m by 20 m with a small L-shaped feature lying just to its north. Their morphology would appear to indicate an Iron Age to Roman date. However, this asset lies within the current confines of the Phillips 66 Site and thus has likely been destroyed by the construction of the Humber Refinery as such the potential to encounter these remains is again considered to be low. If any elements of this asset do survive they should be seen to be of **regional archaeological** and **historical interest** and **medium value** based on their capacity to inform on the nature of and variations local cultural assemblages as well as the economy, industry, trade, agricultural practices and local communication networks.
- 12.6.32 If present, the construction works associated with the Phillips 66 Site would remove up to 100% of this asset. The associated reduction in our ability to understand and appreciate the asset due to the loss of archaeological material would represent a **high** impact resulting in a **major adverse** effect – which would be **significant**.

### ***Medieval – Post Medieval Ridge and Furrow Activity [A53]***

- 12.6.33 The previous geophysical survey and other mapping works, mentioned above, also demonstrate that ridge and furrow activity did, at one time, extend under the Phillips 66 Site. However, the ground disturbance associated with the construction of the extant Humber Refinery has likely entirely removed this asset, and so again the potential to encounter these remains is considered to be low. If elements of this asset were to be present within the Phillips 66 site, they should be considered to be of **local** and **archaeological** and **historical interest** and **low value** based on their capacity to inform on medieval society, economy, agricultural practices and the changes in the medieval landscape from medieval to modern times (shrinkage of medieval settlements, for instance).
- 12.6.34 If present, the construction works associated with the Phillips 66 Site would permanently remove a relatively insignificant extent of the mapped ridge and furrow asset within the wider area. Thus, the associated reduction in our ability to understand and appreciate the asset due to the loss of archaeological material would represent a **low** impact resulting in a **minor adverse** effect – which would **not be significant**.

### ***Previously Unrecorded Heritage Assets***

- 12.6.35 There are no known undisturbed areas within the area of the Phillips 66 Site. Accordingly, the potential to encounter unknown remains is low.
- 12.6.36 The Phillips 66 site exists within a wider landscape of medieval settlement and agricultural activity (associated with the Medieval ribbon villages of North and South Killingholme) and therefore if unknown remains are encountered they may well be associated with these settlements including such things as field boundaries, out buildings etc. The archaeological evidence encountered which associated with this period would likely be of **regional archaeological** and **historical interest** and **medium** heritage value. The scale and spatial extent of construction activities would likely result in the total removal of any such archaeological remains that may be present, resulting in a total loss of heritage value. This would constitute a **high** magnitude of impact, resulting in a **major adverse** effect, which would be **significant**.
- 12.6.37 Additionally, it is possible that archaeological remains associated with the Iron Age – Roman settlement site known to be present within the VPI Site (asset [A20]) extend into the Phillips 66 Site. Again the disturbed nature of the Phillips 66 Site means that the potential for these remains to have survived is low. However, if they were to be encountered, they would be considered to have **regional archaeological** interest and **medium** heritage value. Again, construction activities would likely result in the total removal of these archaeological assets - resulting in a total loss of heritage value. This would constitute a **high** magnitude of impact, resulting in a **major adverse** effect, which would be **significant**.

### ***Historic Landscape Characterisation***

- 12.6.38 The Historic Landscape will be physically impacted by the Proposed Phillips 66 Development. The majority of the Phillips 66 Site lies within the North Lincolnshire Historic Landscape Character (NLHLC) subtype 'Chemical Works' (modern) (North Lincolnshire Council 2021). The Proposed Phillips 66 Development will not alter this characterisation and so is deemed to have a **neutral** effect.
- 12.6.39 In addition, the region of and around the Proposed Phillips 66 Development was also part of the Lincolnshire Historic Landscape Characterisation Project (Lincolnshire County Council 2022). This characterised the area of the Proposed Phillips 66 Development as NOM2: The Northern Marshes (Immingham Coastal Marshes). This is broadly defined as a zone dominated by industrial activity (comprising 36% of the character zone) and which, prior to enclosure in the 18<sup>th</sup> century, was mainly comprised of saltmarsh grazing land. The zone is largely modern in character although historic elements can still be identified in the landscape. The Proposed Phillips 66 Development will not alter this assessment and as a result is deemed to have a **neutral** effect.

### **Assessment of Potential Impacts: Operational Phase (Both Sites)**

- 12.6.40 Once operational, the Proposed Developments could impact heritage assets due to visual elements of the Proposed Developments impinging upon the setting of the assets, particularly any tall, very visible components such as stacks. The impacts of both Proposed Developments are discussed cumulatively below as this represents a worst case scenario.

#### **Designated Assets (Listed Buildings, Registered Parks and Gardens and Scheduled Monuments)**

- 12.6.41 Brocklesby Park **[RPG1]** is a grade I registered park and garden, located 3.5 km from the Phillips 66 Site at its most southerly point. Within the park are also a number of listed structures including the grade I listed Newsham Bridge (**BH27**). There is no intervisibility between the Park and the Sites, separated by sufficient distance and shielded by existing development and woodland. Therefore, the Proposed Developments are not considered likely to impact the asset either visually or in the ability to interpret its significance. Therefore, the Proposed Developments are not considered to have any impact, resulting in a **neutral effect**.
- 12.6.42 A total of thirty-three listed buildings have been identified within 5 km of the Sites. The significance and setting of these assets are detailed within the desk-based assessment in Appendix 12A. Most of the assets are located at a sufficient distance and screened by other existing development so that neither of the Sites is visible nor contributes to the ability to interpret significance. These assets have therefore been scoped out of the assessment. The following listed buildings have been included in this assessment as they are identified as having potential to experience operational effects or are potentially highly sensitive to change within their wider settings and should therefore be carefully considered.
- 12.6.43 The Church of St Denys **[BH7]** is a grade I parish church located approximately 930 m north-west of the Phillips 66 Site. The Lindsey Oil Refinery is visible from the churchyard, this should prevent any views of the Proposed VPI Development and largely shield views of the Proposed Phillips 66 Development. Where there is potential for views of the Proposed Phillips 66 Development, these will blend with the existing view of the industrial skyline and will not alter the setting of the Church. Potential views of the Proposed Phillips 66 Development in the distance will not impact the ability to appreciate the assets significance, resulting in a **neutral effect**.
- 12.6.44 The Old Vicarage **[BH33]** is a grade II former vicarage, now a private residence, located approximately 950 m from the Phillips 66 Site. There is no potential for views of the Proposed Developments as result of development and screening from mature vegetation along Clarke's Road. The Proposed Developments will not impact the ability to interpret the asset's significance or the historic relationship with the Church of St Denys **[BH7]**, therefore constituting a **neutral effect**.

- 12.6.45 The remains of Thornton Abbey **[BH4]** Thornton Abbey gatehouse and wing walls, precinct walls and barbican **[BH1]**, both grade I, are located approximately 4.3 km north of the Phillips 66 Site. The Sites are not visible from the assets obscured by existing development, dense foliage, and mature trees nor do they contribute to the ability to interpret significance, therefore resulting in a **neutral effect**.
- 12.6.46 The Church of St Andrew **[BH6]** grade I is located approximately 1.7 km south of the Phillips 66 Site. The VPI Site is not visible from the Churchyard and long-range views of the Phillips 66 Site are partially screened by the golf course and mature trees and foliage which form the boundary of the Churchyard. Where potential views of the Proposed the Phillips 66 Development remain, these views are not considered likely to diminish the setting of the asset but rather blend into the existing industrial landscape. The presence of the Proposed Developments in some mid and long-distance views will not impact the ability to interpret significance or alter the relationship between the Church and parish, resulting in a **neutral effect**.
- 12.6.47 Manor Farmhouse **[BH19]** grade II\* is located approximately 1.2 km from the Phillips 66 Site. Neither of the Proposed Developments will be visible, shielded by development, mature vegetation and hedgerows. As the Proposed Developments will not result in the loss of any historic agricultural land, therefore it is not considered to impact the setting or significance of the assets, constituting a **neutral effect**.
- 12.6.48 The Nook **[BH21]** is a grade II house located approximately 450 m west of the Phillips 66 Site. There is no intervisibility with the VPI Site from the asset. Despite the close proximity to the Phillips 66 Site, there is limited intervisibility as result of shielding from the South Killingholme Methodist Church to the immediate east of the asset. While the Proposed Developments will feature in the foreground of any remaining restricted views of the Phillips 66 Site, this is expected to blend with the existing industrial character of the Sites. Views of the Proposed Phillips 66 Development are not considered to alter the immediate setting of the asset or impact the ability to interpret special interest. The changes to the wider setting of the asset have little impact upon setting or significance, therefore constitute a very low impact upon an asset of **medium value** resulting in a **minor adverse** effect – which would **not be significant**.
- 12.6.49 The Baptist Chapel **[BH22]** is a grade II former Chapel located approximately 570 m south of the Phillips 66 Site. Potential for intervisibility between the asset and either of the Sites is very limited due to the low height of the Baptist Chapel and shielding from trees and foliage, development along the north side of Chapel Lane and the overpass which crosses Humber Road. Where potential for views of the Proposed Phillips 66 Development remain, these views would be heavily restricted and would blend into the existing industrial skyline. Therefore, the Proposed Developments at both Sites is not considered to alter the setting or ability to interpret significance, resulting in a **neutral effect**.

### ***Shrunken Medieval Settlements [A41 – A44]***

- 12.6.50 Assets **[A41-A44]** are all substantial earthworks which represent the remains of moated manor/ farm sites associated with what was once an extensive row of Medieval villages running between East Halton and South Killingholme. Specifically, East Halton - **[A43]**, the possible lost Medieval settlement of Lopinheham – **[A41]** and **[A42]**, and North Killingholme, **[A44]** – which is also associated with two listed buildings - **[BH19]** and **[BH20]**. Assets **[A41 – A44]** all sit to the north west of the Phillips 66 Site at distance of c.1 km – 3.5 km.
- 12.6.51 The immediate setting of these assets includes the fields/ field systems which sit around them – many of which are unchanged from the Medieval/ post Medieval period, and the ditches and hedges which form these field boundaries. It also includes the modern elements of the villages, hamlets and farmsteads in the area, which sit around and adjacent to all of the assets.
- 12.6.52 The wider landscape of the assets is more heavily industrialised including the Port of Killingholme and the Lindsey oil Refinery to the east. The Humber Refinery to the south-east and a logistics site supporting the ports to the south-west. Elements of all of these are visible from all of these assets. There may also be some intervisibility between all of these assets and designated asset **[A46]** (the site of Thornton Abbey below) which occupies a relatively lower point in the landscape (c. 8 m AOD).

- 12.6.53 The evident archaeological remains of these assets, placed within a setting which still has surviving Medieval/ Post Medieval elements (field layout/ boundaries), contribute toward the **historic** and **archaeological** interest of all of these assets. By definition, all designated assets are of **national** interest and are of potentially **high** heritage value.
- 12.6.54 Asset **[A43]** (NHLE 1007816), is the most distant from the Proposed Developments sitting 3.6 km to the northwest of the Phillips 66 Site. It sits at a height of c. 12 m AOD and so is at a similar height to the Phillips 66 Site (c.12 m AOD) and somewhat higher than the VPI Site (c 5 m AOD). However, the land between the asset and the Sites undulates, with high points of around 15 m AOD (Chase hill – just north of the Lindsey Oil Refinery) and 18 m (areas within the Lindsey Oil Refinery). The distance between the assets and the Sites, combined with the undulations in the landscape which block line of site, and intervening features such as modern buildings, hedgerows and the Lindsey Oil Refinery mean that it is unlikely that either of the Proposed Developments will be visible from this asset, and any taller structural elements which may be visible will simply blend into the already industrial viewpoint toward the Lindsey Refinery. Therefore, the Proposed Developments will not diminish the setting of this designated asset. This would constitute no impact, resulting in a **neutral** effect from both the Proposed Developments.
- 12.6.55 Asset **[A41]** (NHLE 1007813), lies 2 km to the north-west of the Phillips 66 Site at 13 m AOD. Whilst the ground between this asset and the Sites again undulates, the position of the asset - relative to the Sites - means that both Chase Hill and the Lindsey Oil Refinery do not obscure views between the asset and the Sites as much as they do between **[A43]** and the Sites. The Sites are at least partially obscured by distance from the asset, intervening hedgerows and the existing industrial buildings of the Lindsey Oil Refinery and Phillips 66 Humber Refinery - which together create a dominant industrial landscape already visible from this asset. It is possible that the taller elements (towers etc) of the Proposed Phillips 66 Development within the Phillips 66 Site will be visible from the asset, however these will sit within a viewpoint already dominated by similar structures that are part of the existing refineries and so will simply blend into this view. The VPI Site sits further behind the Lindsey Oil Refinery and so is even more obscured by it, it also occupies a slightly lower position in the landscape. As a result, it is unlikely that the VPI Site will be visible from this asset, in any case any elements which are visible will simply blend into the industrial back drop of the Lindsey Oil Refinery. Therefore, whilst the Proposed Phillips 66 Development may have a presence in the views from the asset it will not diminish the setting of the designated asset. This would constitute no impact, resulting in a **neutral** effect from both the Proposed Developments.
- 12.6.56 Asset **[A42]** (NHLE 1007815), lies 1.5 km to the north-west of the Phillips 66 Site at a height of c. 15 m AOD, and is situated overlooking both the Sites. Neither Chase Hill nor the Lindsey Oil Refinery sit along the eyeline between the asset and the Sites. As a result, both Sites are potentially visible from this asset. However, intervening trees and hedges, and the distance to the site do obscure the view to the Sites somewhat. In terms of the Phillips 66 Site, as with **[A41]**, the view from asset **[A42]** to the Site is already dominated by the industrial landscape created by the Lindsey Oil Refinery and the Humber Refinery. Smaller elements of the Proposed Phillips 66 Development would probably not be visible at all and any visible (taller) elements of the Proposed Phillips 66 Development will likely blend into this view, rather than stand out as new elements. The view to the VPI Site is more obscured - by both the Lindsey Oil Refinery and the Humber Refinery. As a result, it is unlikely that the Proposed VPI Development will be visible from this asset, in any case any elements which are visible will simply blend into the industrial back drop of the two refineries. Therefore, whilst the Proposed Developments may have a presence in the views from the asset it will not diminish the setting of the designated asset. This would constitute no impact, resulting in a **neutral** effect from both the Proposed Developments.
- 12.6.57 Asset **[A44]** (NHLE 1008044), sits c. 1 km north-west of the Phillips 66 Site at a height of c. 18 m AOD. Its views points to the Sites are very similar to those of **[A41]**. It is a little closer, but the village of North Killingholme, 200 m to the south, also serves to block some viewpoints to the Sites. Generally, the factors which affect the view from **[A41]** are also true for this asset and so again whilst the Proposed Phillips 66 Development may have a presence in the views from the asset it will not diminish the setting of the designated asset. This would constitute no impact, resulting in a **neutral** effect from both the Proposed Developments.

### ***The Medieval Nunnery of Nun Cotham [A45]***

- 12.6.58 Asset **[A45]** lies c. 5 km to the south of the Phillips 66 Site. It is the location of the remains of the medieval nunnery of Nun Cotham (NHLE 1008686), a priory of Cistercian nuns founded in the mid-12th century and dissolved in 1539. The remains of the nunnery are overlain by those of a post-Dissolution house, garden, farm buildings and other later features. Also associated with the nunnery are a pair of fishponds and a post-medieval windmill mound. None of the structural remains are standing, surviving now only as low earthworks, many of which are only visible from the air.
- 12.6.59 The setting of this asset takes in the fields/ field systems surround it – many of which are unchanged from the Medieval/ post Medieval period, and the ditches and hedges which form the boundaries of these field, as well as a river – The New Beck – which bounds the asset to its east and large area of woodland (Roxton Wood) which sits just beyond this to the east.
- 12.6.60 The evident archaeological remains of this assets, placed within a setting which still has surviving Medieval/ post Medieval elements (field layout/ boundaries), contribute toward the **historic** and **archaeological** interest of this asset. As a designated assets it is of **national** interest and **high** heritage value.
- 12.6.61 The view from this asset to the Proposed Developments will be completely obscured by distance, but more importantly by the large, dense, woodland of Roxton Wood, which sits on the eyeline between the asset and the Proposed Developments, at a height of 24 m AOD. Therefore, the Proposed Developments will have no impact upon the setting of this designated asset, resulting in a **neutral** effect from both the Proposed Developments.

### ***Thornton Abbey [A46]***

- 12.6.62 Asset **[A46]** (NHLE 1011198), Thornton Abbey, sits 3.7 km to the north-west of the Phillips 66 Site at a height of c. 8 m AOD. The Abbey was an Augustinian monastery founded as a priory in 1139. The Abbey precinct covers an area of some 29 ha within which exist a number of extant ruins.
- 12.6.63 The evident archaeological remains of this assets, placed within a setting which still has surviving Medieval/ post Medieval elements (field layout/ boundaries), contribute toward the **historic** and **archaeological** interest of this asset. As a designated assets it is of **national** interest and **high** heritage value.
- 12.6.64 Whilst the landscape between this asset and the Proposed Developments again consists of open fields, the ground undulates and there are a number of hills along the eyeline between them including one which reaches a height of 15 m AOD and another just to the north of North Killingholme which reaches a height of 18 m AOD. Multiple tree and hedge lines also serve to obscure the view between the asset and the Proposed Developments, as do the existing industrial structures of both the Lindsey Oil Refinery and Humber Refinery. It is unlikely that any element of the Proposed Developments will be particularly visible from this asset, although it is possible that taller elements (stacks etc) may be visible in the distance. However, these will simply blend into the already industrialised aspect of this part of the landscape. As a result, whilst the Proposed Developments may have a very minor presence in the views from the asset it will not diminish the setting of the designated asset. This would constitute no impact, resulting in a **neutral** effect from both the Proposed Developments.

## **Non - Designated Assets**

### ***Non – Designated Built Heritage Assets***

- 12.6.65 Killingholme Primary School **[BH36]** is a school located approximately 750 m west of the Phillips 66 Site within a built-up suburban area. The existing Humber Refinery is visible from the asset which forms part of an ‘industrial skyline’ to the east of South Killingholme. The taller elements of the Proposed Phillips 66 Development are comparable in height to elements of the existing Humber Refinery and Lindsey Oil Refinery and will be located within the most visible area of the Site. The Proposed Phillips 66 Development will be visible from the asset but should blend into the background of the existing industrial landscape to a large degree.

The VPI Site should not be visible, located behind the Proposed Phillips 66 Development and Humber Refinery. Views of the Proposed Phillips 66 Development are not considered to alter the setting of the asset or impact the ability to interpret special interest. This constitutes a very low impact upon a low value asset resulting in a **negligible** effect - which would **not be significant**.

- 12.6.66 A number of non-designated agricultural buildings and farmsteads [BH37-BH49] have been identified within the 1 km study area across North and South Killingholme, some are still in use as working farms whilst others have been converted for private residential use. The Proposed VPI Development will not be visible from the assets shielded by existing developments, the Lindsey Oil Refinery and the Humber Refinery. The Proposed Phillips 66 Development will be visible from some of the assets. However, again this should blend into the existing industrial skyline. As the Proposed Developments will not result in the loss of any historic agricultural land, it is not considered to impact the setting or ability to interpret special value of the assets resulting in **no impact**.
- 12.6.67 A memorial stone [BH50] is located approximately 930 m north-west of the Phillips 66 Site within the churchyard of the Church of St Denys, North Killingholme. There is low potential for intervisibility between the asset due to the existing screening of the churchyard by mature trees and vegetation and the location of the Lindsey Oil Refinery between the asset and both Sites. Therefore, the Proposed Developments are considered to have **no impact**.

### ***Non-Designated Archaeological Assets***

- 12.6.68 The 1 km study area around the Proposed Developments contains 135 non-designated assets. Most of these will have some view to the Proposed Developments due to the generally open nature of the landscape. Whilst modern structures (houses, farms etc), hedgerows, trees and undulations in the ground level will obscure the views of some asset to the Proposed Development, some elements of the Proposed Developments will still be visible to many other assets. However, as previously mentioned the Proposed Developments sit within an already heavily industrialised area. As a result, the visible elements of the Proposed Developments will likely blend into this already industrialised backdrop and not alter the skyline or views to this area from the majority of these assets in any significant way, and so will not diminish their settings. Additionally, for many of these buried remains – particularly those which predate the medieval period - the current setting cannot be seen as the 'original' setting in which the archaeological remains were founded, it has changed and developed over time. Thus, further change, to an already altered environment, cannot be seen as significant. Accordingly, the Proposed Developments are deemed as having no impact upon non-designated archaeological assets, resulting in a **neutral** effect from both the Proposed Developments.

### **Assessment of Potential Impacts: Decommissioning (Both Sites)**

- 12.6.69 The date and exact nature of the decommissioning of the Proposed Developments is uncertain. Decommissioning of the Proposed Developments will take place in accordance with the relevant statutory process at that time. The selected method of decommissioning would have due regard to health and safety, environmental impact and benefits, and economic aspects which will be set out in a Decommissioning Environmental Management Plan (DEMP). Any future maintenance, decommissioning and/ or reinstatement works would be subject to prevailing legislation, guidance and permitting regimes. It is anticipated that landscape restoration and remediation to suitable surfaces would be undertaken. A well-designed decommissioning plan would not have any impact beyond the already-disturbed footprint of the Proposed Developments; therefore, it is not anticipated that decommissioning activities would have a direct physical impact upon archaeological remains beyond those reported in this chapter relating to the construction of the Proposed Developments.
- 12.6.70 Additionally, whilst there is the potential for temporary setting impacts during the removal of the infrastructure associated with the Proposed Developments, it is not anticipated that this will cause additional impacts to any assets setting, over and above those reported in this chapter relating to the construction and long-term presence of the Proposed Developments.

Upon completion of decommissioning, any long-term adverse effects from Proposed Developments will cease to exist and the setting of the cultural heritage assets which have been impacted by the Proposed Development will be restored to the baseline conditions. This will have a neutral impact on the significance of these assets.

## 12.7 Mitigation and Enhancement Measures

12.7.1 The effects of the Proposed Developments on heritage assets, as detailed in Section 12.6, can potentially be reduced by a number of mitigation measures additional to those already identified in Section 12.5. The following sections will examine the feasibility of these and the reduction in effect their implementation may have upon heritage assets.

### Construction Phase Mitigation

12.7.2 During the construction phase of the Proposed Developments direct physical impact upon archaeological remains could be reduced by the implementation of a number of mitigation measures either on their own or in combination with each other. These theoretical options are:

1. Mitigation by avoidance – employing this mitigation measure entails a proposed development being designed in such a way as to completely avoid any impacts upon any known heritage assets i.e. all elements of the development are designed in such a way so as to completely avoid all known heritage assets. This would also naturally result in preservation in situ of these assets;
2. Mitigation by preservation in situ – employing this mitigation measure entails a proposed development being designed in such a way that whilst work may impact heritage assets, the impact does not damage the asset which effectively preserves the asset where it is e.g. placing landscape bunds over known heritage assets rather than ground penetrative development elements (buildings etc); and
3. Mitigation by investigation and recording. Where the other two options are not feasible a proportionate programme of detailed archaeological, investigation, recording, analysis, and publication allows the data the assets represent to be preserved when the physical remains of the asset itself cannot be. This option is typically implemented when implementation of the other two options is not feasible.

12.7.3 Mitigation comprising avoidance and/ or preservation in situ of archaeological remains would result in no impacts to heritage assets and the residual effect for all assets would be neutral. However, for the Proposed Developments assessed in this chapter avoidance and/or preservation in situ are not feasible. As a result mitigation by investigation and recording will be implemented as required in order to reduce the potential effects of the Proposed Developments upon heritage assets. Some investigation and evaluation has already been undertaken (as part of mitigation embedded into the design of the Proposed Developments) and is described in Section 12.5. A summary of the residual effects that would remain upon the assets following the implementation of this mitigation measure is provided in Table 12.6.

### Operation Phase Mitigation

12.7.4 This assessment does not identify any significant impacts upon heritage assets as a result of the operation of the Proposed Developments. As a result no additional mitigation measures are required.

## 12.8 Residual Effects

### Assessment of Residual Effects – Construction Phase

12.8.1 Table 12.6 (below) details the residual effects on the heritage assets from the Proposed Developments where additional mitigation measures have been implemented for the construction phase.

**Table 12.6: Summary of residual effects - construction phase**

The below refers to a number of options for archaeological mitigation measures, all of which would be implemented in a manner proportionate to the Proposed Developments and the anticipated archaeological remains. These options are:

- 1) Intrusive investigation and recording works, the location and extent of which would be informed by previous work options – includes such things as strip, map and record.
- 2) Monitoring – archaeological monitoring of all construction works.
- 3) Topographic survey / historic landscape survey.
- 4) Publication - proportionate publication of all work undertaken.

Receptor Description	Site	Value/ Sensitivity of Receptor	Description of Potential impact	Magnitude of impact	Significance of effect	Mitigation measures (see options list above)	Residual Effect	
							Magnitude	Significance of effect
Ancient Foreshore and associated paleochannels and deposits [A122]	VPI	Medium	Permanent loss of approximately 50% of the recorded extent of this asset (if present) as a result of the construction of the Proposed VPI Development	Medium	Moderate adverse (significant)	Options 1 and 4	Low	Minor adverse (not significant)
Bronze Age – Roman settlement activity [A11 – A13] and [A16]	VPI	Medium	Permanent loss of significant percentage of the asset (if present) as a result of the construction of the Proposed VPI Development	Medium	Moderate adverse (significant)	Options 1 and 4	Low	Minor adverse (not significant)
Iron age – Roman settlement [A20]	VPI	Medium	Permanent loss of significant percentage (up to 100%) of the asset (if present) as a result of the construction of the Proposed VPI Development	High	Moderate adverse (significant)	Options 1 and 4	Low	Minor adverse (not significant)
Medieval – Post Medieval Ridge and Furrow activity [A53]	VPI	Low	Permanent loss of a small percentage of the recorded extent of this asset (if present) as a result of the construction of the Proposed VPI Development	Low	Minor adverse (not significant)	Options 1 and/ or 3 and 4.	Very low	Negligible adverse (not significant)

The below refers to a number of options for archaeological mitigation measures, all of which would implemented in a manner proportionate to the Proposed Developments and the anticipated archaeological remains. These options are:

- 1) Intrusive investigation and recording works, the location and extent of which would be informed by previous work options – includes such things as strip, map and record.
- 2) Monitoring – archaeological monitoring of all construction works.
- 3) Topographic survey / historic landscape survey.
- 4) Publication - proportionate publication of all work undertaken.

Receptor Description	Site	Value/ Sensitivity of Receptor	Description of Potential impact	Magnitude of impact	Significance of effect	Mitigation measures (see options list above)	Residual Effect	
							Magnitude	Significance of effect
Medieval / Post Medieval field boundary ditches [A72]	VPI	Low	Permanent loss of significant percentage of the asset (if present) as a result of the construction of the Proposed VPI Development	Medium	Minor adverse (not significant)	Options 1 and/ or 3 and 4.	Low	Minor adverse (not significant)
Land boundary associated with hedgerow [A70] and [A71]	VPI	Low	Permanent loss of significant percentage of the asset (if present) as a result of the construction of the Proposed VPI Development	Medium	Minor adverse (not significant)	Options 1 and/ or 3 and 4.	Low	Minor adverse (not significant)
Previously unrecorded heritage assets	VPI	Medium	Permanent loss of some or all of the asset (if present) as a result of the construction of the Proposed VPI Development	High	Major adverse (significant)	Options 1 and 4	Low	Minor adverse (not significant)
Historic Landscape Characterisation	VPI	Very Low	Alteration of the character of a relatively small area of this landscape	Medium	Minor adverse (not significant)	Option 3 if necessary and then 4.	Low	Negligible adverse (not significant)

The below refers to a number of options for archaeological mitigation measures, all of which would implemented in a manner proportionate to the Proposed Developments and the anticipated archaeological remains. These options are:

- 1) Intrusive investigation and recording works, the location and extent of which would be informed by previous work options – includes such things as strip, map and record.
- 2) Monitoring – archaeological monitoring of all construction works.
- 3) Topographic survey / historic landscape survey.
- 4) Publication - proportionate publication of all work undertaken.

Receptor Description	Site	Value/ Sensitivity of Receptor	Description of Potential impact	Magnitude of impact	Significance of effect	Mitigation measures (see options list above)	Residual Effect Magnitude	Significance of effect
Paleochannels and deposits [A122]	Phillips 66	Medium	Permanent loss of approximately 50% of the recorded extent of this asset (if present – low potential given historic land use) as a result of the construction of the Proposed Phillips 66 Development.	Medium	Moderate adverse (significant)	If remains are deemed to have good potential to have survived (to be determined following monitoring of pre-construction geotechnical survey), then further evaluation/ investigative work will then be undertaken by implementation of options 1, 3 and 4 as appropriate. If there is low potential for survival then option 2, as necessary, then 4 will be implemented	Low	Minor adverse (not significant)
Rectilinear crop mark [A25]	Phillips 66	Medium	Permanent loss of significant percentage (up to 100%) of the asset (if present – low potential given historic land use) as a result of the construction of the	High	Major adverse (significant)	If remains are deemed to have good potential to have survived (to be determined following monitoring of pre-construction geotechnical survey), then implementation of	Low	Minor adverse (not significant)

The below refers to a number of options for archaeological mitigation measures, all of which would implemented in a manner proportionate to the Proposed Developments and the anticipated archaeological remains. These options are:

- 1) Intrusive investigation and recording works, the location and extent of which would be informed by previous work options – includes such things as strip, map and record.
- 2) Monitoring – archaeological monitoring of all construction works.
- 3) Topographic survey / historic landscape survey.
- 4) Publication - proportionate publication of all work undertaken.

Receptor Description	Site	Value/ Sensitivity of Receptor	Description of Potential impact	Magnitude of impact	Significance of effect	Mitigation measures (see options list above)	Residual Effect	
							Magnitude	Significance of effect
			Proposed Phillips 66 Development.			options 1 and 4 as appropriate. If there is low potential for survival then option 2, as necessary, then 4.		
Medieval – Post Medieval Ridge and Furrow activity [A53]	Phillips 66	Low	Permanent loss of a small percentage of the recorded extent of this asset (if present – low potential given historic land use) as a result of the construction of the Proposed Phillips 66 Development.	Low	Minor adverse (not significant)	If remains are deemed to have good potential to have survived (to be determined following monitoring of pre-construction geotechnical survey), then implementation of options 1 and 4 as appropriate. If there is low potential for survival then option 2, as necessary, then 4.	Very low	Negligible adverse (not significant)
Previously unrecorded heritage assets	Phillips 66	Medium	Permanent loss of significant percentage of the asset (if present – low potential given historic land use) as a result of the construction of the	High	Major adverse (significant)	If remains are deemed to have good potential to have survived (to be determined following monitoring of pre-construction geotechnical survey), then	Low	Minor adverse (not significant)

The below refers to a number of options for archaeological mitigation measures, all of which would implemented in a manner proportionate to the Proposed Developments and the anticipated archaeological remains. These options are:

- 1) Intrusive investigation and recording works, the location and extent of which would be informed by previous work options – includes such things as strip, map and record.
- 2) Monitoring – archaeological monitoring of all construction works.
- 3) Topographic survey / historic landscape survey.
- 4) Publication - proportionate publication of all work undertaken.

Receptor Description	Site	Value/ Sensitivity of Receptor	Description of Potential impact	Magnitude of impact	Significance of effect	Mitigation measures (see options list above)	Residual Effect Magnitude Significance of effect
			Proposed Phillips 66 Development.			implementation of options 1 and 4 as appropriate. If there is low potential for survival then option 2, as necessary, then 4.	

## Assessment of Residual Effects – Operational Phase

- 12.8.2 There are no significant effects arising from the operation of the Proposed Developments and additional mitigation is neither required nor proposed. As such, residual operational effects remain the same as those reported in Section 12.6.

## Conclusions

- 12.8.3 The Proposed Developments sit in an area relatively rich in archaeological and cultural heritage assets. To the east of the Sites the ancient foreshore drew prehistoric and Romano-British activity which exploited the estuarine resources. Beyond this, further to the west early Medieval - Medieval settlements established a farming regime across the rich agricultural land of the region.
- 12.8.4 The Sites and their environs are heavily industrialised. Approximately half of the VPI Site (the southern half) appears to be relatively undisturbed and thus the Proposed VPI Development has the potential for adverse impacts upon both unknown and known archaeological assets at this location. The known assets include palaeoenvironment evidence of the ancient foreshore, an Iron Age/ Roman settlement, Bronze Age – Iron Age activity and the remains of land boundaries and field systems associated with the Medieval use of the land. A programme of archaeological mitigation and investigation (based on the results of the previous evaluation and investigation works) will help in mitigating against, and so reducing, the significance of the effects of these impacts.
- 12.8.5 The Phillips 66 Site appears to be more disturbed, with no apparent areas where archaeological assets may have survived within the boundary of the Proposed Phillips 66 Development.. A geotechnical survey will be undertaken in advance of construction. This will be monitored by a suitable geoarchaeologist and the data collected used to inform as to the presence/ degrees of preservation of any archaeological features or deposits at this Site. This information along with the data presented in the baseline will be used to determine if any further archaeological works (such as monitoring) need to occur during the construction of the Proposed Phillips 66 Development. This will be determined in liaison with the Heritage Environment Officer for NLC.
- 12.8.6 As noted, the Proposed Developments sit within a highly industrialised area. This includes the extant Humber Refinery, the extant VPI Immingham CHP Plant and the Lindsey Oil Refinery within the immediate vicinity, with Immingham Docks, Killingholme Port and a large logistics site very nearby. As a result the skyline of the Proposed Developments will blend into this existing industrial landscape and will not have any effect upon the understanding and appreciation of the setting of any of the archaeological assets identified. Two built heritage assets, the Nook **[BH21]** and Killingholme Primary School **[BH36]** are expected to experience adverse effects as result of the presence of the Proposed Phillips 66 Development within the landscape, constituting minor changes to their wider settings. These are not considered to be significant. Mitigation, such as screening measures are not recommended as this would likely amplify the presence of the Proposed Developments rather than reduce visual impact.

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