NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 25.1 Cable landfall search area historic environment desk-based assessment (DBA)

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Glossary of Acronyms

ADS	Archaeology Data Service
ALS	Airborne Laser Scanning
APS	Air Photo Services Limited
CAA	Conservation Area Appraisal
CIfA	Chartered Institute for Archaeologists
DCMS	Department of Culture, Media and Sport
EIA	Environmental Impact Assessment
HES	Essex County Council Historic Environment Services (Place Services)
EHER	Essex Historic Environment Record
ES	Environmental Statement
GIS	Geographic Information System
IEMA	Institute of Environmental Management & Assessment
IHBC	Institute of Historic Building Conservation
LiDAR	Light Detection and Ranging
NFID	North Falls Identification Number
NFOW	North Falls Offshore Wind Limited
NHLE	National Heritage List of England
NMP	National Mapping Programme
NRHE	National Record of the Historic Environment
NPPF	National Planning Policy Framework
NPS	National Policy Statement
PAS	Portable Antiquities Scheme
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
ZTV	Zone of Theoretical Visibility

Glossary of Terminology

The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Landfall	The location where the offshore cables come ashore.
Cable landfall search area	Locations being considered for the landfall, comprising the Essex coast between Clacton-on-Sea and Frinton-on-Sea and areas immediately inland thereof.
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the project so that it can be connected to the National Grid.
Setting	The NPPF identifies setting as that which encompasses an asset's surroundings in which it is experienced. The extent of setting is not fixed and can contribute both positively and negatively to the heritage significance of an asset.

1 Executive Summary

1. Royal HaskoningDHV was commissioned by North Falls Offshore Wind Farm Ltd to undertake a high-level historic environment desk-based (baseline) assessment for the 'cable landfall search area' of North Falls Offshore Wind Farm in September 2021, to inform early site selection activity and to form part of the Environmental Impact Assessment baseline, informing the subsequent Preliminary Environmental Information Report and Environmental Statement submissions. This report forms an early high-level review of historic environment baseline data within the defined cable landfall search area study area.

2. Two study areas have been established and are defined as follows:
   - Non-designated heritage assets study area: defined as all land within the cable landfall search area; and
   - Designated heritage assets study area: defined as all land within the cable landfall search area plus a 5km buffer.

3. This desk-based assessment provides an initial collation and characterisation of designated assets within the 5km study area in order to provide a constraints mapping exercise to feed into the design and site selection process. As the project intends to avoid all designated heritage assets, no direct physical impacts are anticipated to occur. These assets will therefore predominantly form part of the settings assessment in the wider Preliminary Environmental Information Report and Environmental Statement, in which they will be considered in greater detail, so that any non-physical impacts associated with a change in setting resulting from the project's operation can be more fully understood.

4. This desk-based assessment also provides an initial collation and characterisation of non-designated assets and is supported by the results of the Air Photo Services aerial-imagery assessment to identify key areas of potential archaeological sensitivity and outline recommendations for further assessment work.

5. At this stage the location of above ground infrastructure and potential cable routes have not yet been confirmed and as such this report does not provide an assessment of potential impacts, but instead broadly identifies the potential impacts on the historic environment resource based on the known project components. Further assessment of impacts on the historic environment will be considered in the wider Preliminary Environmental Information Report and Environmental Statement.

2 Introduction

2.1 Project and Report Background

6. The North Falls offshore wind farm project (herein 'the project') is a proposed extension to the Greater Gabbard offshore wind farm, which is located off the coast of Suffolk, England and was opened in 2013. The project is being developed by North Falls Offshore Wind Farm Ltd (NFOW)., a joint venture between SSE Renewables and RWE.

7. The project is proposed in response to The Crown Estate's extension leasing round, launched in 2017, with The Crown Estate recognising that extensions to operational wind farms are proven to be a successful way of efficiently developing more offshore generating capacity.

8. The project is currently awaiting a grid connection offer from National Grid, which will then inform the detailed site selection of the offshore cable corridor, landfall location, onshore cable route and onshore substation location. Prior to confirmation on the grid connection offer, NFOW has identified a potential cable landfall development area (herein referred to as the 'cable landfall search area' and is shown in Figure 1), for the purposes of commencing baseline data collection to inform the project's Environmental Impact Assessment (EIA). The current cable landfall search area is based on assumptions made by NFOW, and therefore should not yet be interpreted as the basis for site and route selection activities in relation to the project.

9. Royal HaskoningDHV (RHDHV) was commissioned to undertake a high-level historic environment desk-based (baseline) assessment (DBA) for the 'cable landfall search area' of NFOW, to inform early site selection activity and to form part of the EIA baseline, informing the subsequent, Preliminary Environmental Information Report (PEIR) and Environmental Statement (ES) submissions. This report forms an early high-level review of historic environment baseline data within the defined cable landfall search area study area (Section 3.2). This will likely be expanded and/or refined as a result of the findings of this DBA and as the wider project progresses. The historic environment comprises all designated and non-designated heritage assets, including e.g. built heritage, buried archaeological remains and historic earthworks.

10. The DBA presents the known heritage assets (historic environment resource) recorded in the Essex Historic Environment Record (EHER) and the National Heritage List for England (NHLE). The DBA also includes a bespoke assessment of historic mapping, LiDAR data, National Mapping Programme (NMP) and aerial images carried out by Air Photo Services (APS, 2021) for the cable landfall search area. Gazetteers of all designated and non-designated heritage assets are included in Annex A and Annex C.

11. A characterisation of the baseline, as well as a statement on the potential for encountering archaeological remains which are, at present, unknown is included in this report. Further detailed assessment of impacts, associated effects and anticipated mitigation will be included within the Historic Environment PEIR chapter. This DBA, as well as subsequent DBA work covering additional areas of the project's onshore infrastructure once they have been defined, will support the scope of the PEIR Chapter and subsequent ES Chapter for the Onshore Historic Environment.

2.2 Site Description

12. The cable landfall search area comprises a relatively rural area of fieldscapes punctuated with smaller rural settlements, between the outlying urban areas of Holland-on-Sea and Frinton-on-Sea. The extant modern fieldscape is a patchwork of earlier relict boundaries, where modern agricultural techniques, progressive land reclamation and improvement/reclamation from the Medieval period onwards have shaped the present landscape. At the coast the area comprises Holland Haven Country Park and Holland Haven Marshes Site of Special Scientific Interest (SSSI), Frinton Golf Course and a waste-water treatment works. The Holland Brook passes through the area on an northwest-southeast alignment and is located within a marshy valley, formerly a tidal estuary. Several relatively isolated farmsteads are located within the cable landfall search area.

2.3 Aims and Objectives

13. The specific aims and objectives of this DBA are to:

- Outline the known and potential heritage assets, based on a review of existing information to provide an archaeological and historical baseline within a defined study area;
- Assess the significance of the known and potential heritage assets through a consideration of their archaeological, architectural, artistic and historic interest, and to provide a consideration of the contribution that setting has on their significance, where relevant and at a high-level only at this stage;
- Inform the site selection process, identify any potential constraints and outline the broad potential for impacts upon heritage assets and their significance as part of a high-level assessment;
- Scope areas of archaeological sensitivity and identify areas for further assessment where further qualification of the potential for buried archaeological remains would be required.

3 Methodology

3.1 Introduction

14. The following methodology has been designed in a manner consistent with good practice professional guidance outlined by the Chartered Institute for Archaeologists (CIfA) “Standards and guidance for historic environment desk-based assessment” (CIfA, 2020).

15. The approach taken for the ongoing wider assessment work within the PEIR chapter will be discussed and agreed with Historic England, Tendring District Council and Essex County Council Historic Environment Service (HES) (Place Services).

3.2 Study Area

16. For the purposes of this high-level desk-based assessment, two principal study areas have been established, defined as follows:

- Non-designated heritage assets study area: defined as all land within the cable landfall search area; and
- Designated heritage assets study area: defined as all land within the cable landfall search area plus a 5km buffer.

3.3 Sources

17. Sources that contain relevant historic environment information have been consulted in the production of this DBA. This includes:

- Online ‘Listing data’ from the NHLE, maintained by Historic England, for information and shapefiles of designated heritage assets (Scheduled

Monuments, Listed Buildings, Registered Parks and Gardens, Registered Battlefields and World Heritage Sites);

- National Record for the Historic Environment (NRHE), maintained by Historic England, for information derived from the former National Buildings Record (NBR) and National Archaeological Record (NAR);
- EHER search for information on non-designated heritage assets and historic landscape characterisation data;
- EHER event records for previous archaeological investigation reports;
- Tendring District Council website for information on Conservation Areas;
- The Essex Record Office for historic mapping including pre-Ordnance Survey maps, published and unpublished documentary sources (sourced by APS);
- Landmark data (sourced by APS);
- LiDAR data (sourced by APS);
- Geological mapping and borehole information held by the British Geological Survey;
- Data from the Portable Antiquity Scheme (PAS) accessed through information held by the EHER, with supplementary information accessed via the online database, which records chance finds recovered and reported to them; and
- Assessment of relevant archaeological grey literature reports held by the Archaeology Data Service (ADS) and the EHER.

18. The above list of sources was presented to Tendring District Council, Essex County Council, and Historic England during the first initial Expert Topic Group meeting on the 6th of July 2021. As a result of the consultation it was agreed that the following sources should also be considered, and as such the relevant results of these studies have been included in this DBA and will be incorporated into the subsequent PEIR and ES chapters:

- *Tendring District Historic Environment Characterisation Report* (Tendring District Council and Essex County Council 2008);
- *Tendring Geodiversity Characterisation Report* (Tendring District Council and Essex County Council 2009); and
- *Essex Historic Grazing Marsh Project* (Essex County Council 2014).

19. These sources were collated into a dataset of designated and non-designated heritage assets within the study areas and are presented as part of the baseline conditions described in Section 5. Following the collation of data, it was compiled into gazetteers (Annex B and Annex C) with the digital information plotted into a geographic information system (GIS) dataset along with mapping data, allowing for rigorous spatial analysis of the dataset.

20. Detailed Urban Characterisation studies for Clacton, Frinton and Walton have been produced by Essex County Council, Tendring District Council and Historic England as part of the Seaside Heritage Project. The results have not been

included within this DBA, but will be reviewed, where relevant, as part of the PEIR and ES.

3.3.1 Cartographic sources

21. This baseline DBA includes the results of a map regression exercise undertaken by APS (APS, 2021). The APS report and accompanying figures are also included in Annex D. This data has been scrutinised by APS as part of their assessment appended to this DBA (Annex D, APS, 2021).

22. It should be noted that it was not possible to reproduce the relevant Tithe and Enclosure maps, due to current restrictions and staffing at the Essex Record Office. As such, it was not possible to include these maps in the present assessment, however, when they become available they will included in an updated version of the APS report.

23. This historic map data will be subject to a detailed examination as part of the ongoing development of the full PEIR assessment, ES chapter and DCO application to be submitted in due course.

3.3.2 Aerial photographic data

24. This baseline DBA includes the results of the aerial photographic data assessment, undertaken by APS. The APS report and accompanying figures are also included in full as Annex D. Aerial photographs can be very useful for identifying and / or assisting in the interpretation and identification of heritage assets and archaeological remains. The following sources were consulted in order to compile the aerial photographic data assessment:

- EHER;
- Historic England Archive, Swindon;
- Available online images at Google Earth and Bing; and
- NMP.

25. Further details regarding the methodology adopted for the aerial photographic data assessment are provided in Annex D.

3.3.3 Light Detection and Ranging (LiDAR)

26. This baseline DBA includes the results of the LiDAR data assessment, also undertaken by APS (APS, 2021), and is also included in full as Annex D. LiDAR is a remote sensing technique and stands for ‘Light Detection And Ranging’. The technique uses an active laser sensor, which sends and receives rapid pulses of laser light from an airborne aircraft (sometimes known as Airborne Laser Scanning or ALS). The pulses of laser light strike the surface of the earth and are reflected back to the aircraft. The time taken for a pulse of light to reach the ground and return is recorded by the sensor, which allows the three-dimensional (x, y, z) location of a point to be determined. As such, LiDAR data can produce horizontally and vertically accurate elevation measurements, thereby enabling archaeological sites which survive as upstanding earthworks (sometimes only very subtle in nature) to be mapped. LiDAR data can also

provide a greater insight into the surroundings of already known archaeological remains and can be used in conjunction with other methods such as aerial photographic assessment.

27. The assessment of LiDAR data which informs this baseline DBA was based on freely available data from the Environment Agency, reviewed in conjunction with aerial photographic data. Further details regarding the methodology adopted for the LiDAR data assessment are provided in Annex D.

3.3.4 Data Handling

28. Of the sources outlined in Section 3.3, those with spatial data were incorporated into a GIS dataset using ArcGIS 10.8.1 so that they could be spatially analysed. The data were subsequently compiled into two gazetteers, one for designated heritage assets (Annex B and Annex C) and another for non-designated heritage assets, which also covers where monuments and find spots have been recovered / identified during specifically planned previous archaeological events. Designated heritage assets were assigned a project-specific North Falls (NF) ID number in a numerical sequence between 1 and 159, and non-designated heritage assets between 160 and 226. At this baseline DBA stage it is known that there are some duplicated records between the two datasets, but these have been rationalised, so any designated heritage assets also listed in the NHLE have one single NF ID number. For the purposes of this report, the gazetteers are compiled and illustrated in British National Grid.

3.3.5 Chronology

29. Archaeological, cultural and historic material is generally studied within a framework of 'periods' or 'ages' that reflect the activities and cultural changes taking place over time. Dates are referred to as BC (before Christ), BP (before present) or AD (Anno domini) within the text. BP dates are used for periods of time older than circa 10,000 years ago whereas BC and AD affectively refer to calendar years. Archaeological periods have been broadly defined by the following date ranges:

- Palaeolithic: -1,000 000 to -10,000 BP
- Mesolithic: -10,000 to -4,000 BC
- Neolithic: -4,000 to -2,200 BC
- Early Prehistoric -1,000 000 to -4,000 BC
- Bronze Age: -2,600 to -700 BC
- Iron Age: -800 BC to 43 AD
- Later Prehistoric -4,000 BC to 43 AD
- Prehistoric -1,000 000 BC to 43 AD
- Roman: 43 to 410 AD
- Early Medieval (Saxon): 410 to 1066 AD
- Medieval: 1066 to 1540 AD

- Post Medieval: 1540 to 1901 AD
- 19th Century: 1800 to 1899 AD
- Modern: 1900 AD to present day

3.3.6 Assessing Heritage Significance and Importance

30. The term significance, in relation to heritage policy, is identified in the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government 2021 NPPF Annex 2: Glossary) as "The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting."

31. The importance of a heritage asset is the overall value assigned to it based on its heritage significance, e.g. reflecting its statutory designation or, in the case of non-designated assets, the professional judgement of the assessor. Historic England's industry standards and guidance (Historic England, 2015b and Historic England, 2017a) also refers to an asset's 'level of significance', which in this usage has the same meaning as importance.

32. Designated assets (e.g. Scheduled Monuments, Listed Buildings), non-designated heritage assets (e.g. HER monuments) and potential heritage assets (e.g. currently unknown archaeological remains) can all be identified as having a very high heritage significance, although designated heritage assets will be identified as high or very high significance more often than non-designated heritage assets. This is often due to the quality of a designated asset's survival and preservation, and/or a combination of its archaeological, architectural, artistic and historic interests.

33. Relevant to this definition of heritage significance, evidence for some heritage assets, particularly non-designated buried archaeological remains, is often an incomplete picture due to a lack of data on the remains (e.g. where they haven't been subject to any form of archaeological evaluation). Thus, the categories and definitions of heritage significance do not necessarily reflect a definitive level of importance for a non-designated asset. Where uncertainty occurs, a precautionary approach is to assign high importance; a good practice in impact assessments, which reduces the potential for impacts to be under-estimated.

3.3.7 Setting of heritage assets

34. A heritage asset's setting, and how it contributes to its significance, is a complex and far reaching subject. The NPPF identifies setting as that which encompasses an asset's surroundings in which it is experienced. The extent of setting is not fixed and can contribute both positively and negatively to the heritage significance of an asset.

35. Views allow for a concise method of articulating an asset's physical surroundings and how the setting is experienced or appreciated. Other considerations when identifying how setting contributes to an asset's significance include the asset's physical elements as well as perceptual and associational attributes relating to its surroundings. Examples of these

considerations include: the asset's relationship with other assets, its visual dominance, tranquillity, effect of noises, smells and other 'pollution' issues, degree of interpretation or promotion to the public, and celebrated artistic representations.

36. Identifying and articulating the setting of a heritage asset and how that setting contributes to its heritage significance follows the methodology as recommended by Historic England in the Setting of Heritage Assets: Historic Environment Good Practice Advice in planning Note 3 (Historic England, 2017a).

37. This guidance document recommends a stage-based approach for assessing the implications of development proposals, as follows:

- Step 1: identify those heritage assets whose settings might be affected;
- Step 2: assess whether, how and to what degree setting makes a positive contribution to the value of those heritage assets;
- Step 3: assess the effect of the proposed development on the significance of those assets due to changes to setting;
- Step 4: maximise enhancement and minimise harm; and
- Step 5: make and document decisions and monitor outcomes.

38. The first step of this process has been undertaken as part of this report. Once there is further indication of the location of above ground infrastructure, further consideration of setting assessment can be progressed. In the meantime, the baseline data gathered within 5km of the cable landfall search area can be used to feed into the site selection process and should inform potential areas for avoidance of designated assets or early micrositing of infrastructure.

39. An initial appraisal of designated and non-designated heritage assets (Annex B and Annex C, Figure 3 and Figure 4) within these study areas was carried out using current and historic OS mapping, Google Maps, and information provided by the NHLE and EHER.

40. No walkover survey has been undertaken at this stage as the present DBA aims mainly to identify and characterise the available data within the study areas and highlight any areas where further, more detailed assessment will be required. A walkover survey will be undertaken once the onshore project area has been better defined and will form either an Addendum to this report or a separate accompanying report.

3.3.8 Assumptions and Limitations

41. The EHER is not a complete record, as it relies on non-designated assets being recorded and reported. The amount of archaeological work and surveys undertaken in an area and whether resulting findspots have been reported can limit the level of records within the HER. Similarly, unknown heritage assets are being found regularly, as part of new developments or new local research. As such, the HER is not a final record and does not preclude further assets being found in the future.

42. The report does not include a walkover survey as the exact location and layout of infrastructure has not yet been fully established. A walkover survey will be undertaken once the onshore project area has been better defined and will form either an Addendum to this report or a separate accompanying report.

4 Legislation, Policy and Guidance

4.1 Legislation

4.1.1 Ancient Monuments and Archaeological Areas Act (1979) (as amended)

43. This act states that any archaeological site or historic building of national importance can be designated as a Scheduled Monument and registered with the Department of Culture, Media and Sport (DCMS). Any development that may physically affect the monument is subject to the granting of Scheduled Monument Consent. Historic England advises the government on individual cases for consent and offers advice on the management of Scheduled Monuments.

4.1.2 Planning (Listed Buildings and Conservation Areas) Act (1990)

44. This act covers the registration of listed buildings (buildings that are seen to be of special architectural or historic interest) and the designation of Conservation Areas (areas of special architectural or historic interest, the character of which is desirable to preserve or enhance). A building may be listed as grade I, II* or II and may not be demolished, altered or extended without Listed Building Consent being granted.

4.1.3 Historic England Register of Parks and Gardens

45. The Register of Parks and Gardens is held by Historic England, which grades registered parks and gardens as grade I, II* or II, along the same lines as listed buildings. Registered parks or gardens are not protected by a specific act or consenting regime but local authorities will give great weight to their conservation. The NPPF defines them as a designated heritage asset and as such their conservation is an objective of sustainable development.

4.1.4 Hedgerow Regulations 1997, as amended by The Hedgerows (England) (Amendment) Regulations 2002

46. These regulations define which hedgerows within England are identified as important and protected against removal and various other works. Heritage-specific criteria for precluding removal of a hedgerow includes if the hedge forms a historic parish or township boundary; it incorporates an archaeological feature which is a Scheduled Monument; or is part of a field system forming part of a key landscape characteristic, such as a Registered Park and Garden.

4.2 National Policy

4.2.1 National Planning Policy Framework

47. The NPPF (Ministry of Housing, Communities & Local Government, updated 2021) forms the basis for the Government's planning policy direction. It gives protection to designated and non-designated heritage assets. Provision for the historic environment is detailed within Section 16: Conserving and Enhancing the Historic Environment, which directs Local Planners to set out a "positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats" (para. 190) and "In doing so, they should recognise that heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance" (para. 189).

48. The NPPF also states that great weight should be given to the conservation of designated heritage assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas). If an asset is identified as being lost due to a development, it requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible (para. 205).

4.2.2 National Policy Statements for Energy

49. These policies (specifically EN-1: Overarching NPS for Energy and EN3: National Policy Statement for Renewable Energy infrastructure) set out the Government's policy for delivery of nationally significant energy infrastructure. Section 5.8 of EN-1 sets out the Government's stance on protecting the historic environment and assessing the impact of any new energy infrastructure. It states that in considering the impact of a proposed development on any heritage assets, the Planning Inspectorate (PINS) should consider the nature and significance of the assets and the value they hold. Section 2.5.34 of EN-3 also states that when considering any impact on the historic environment, PINS should take into account the positive role that large-scale renewable projects play in the mitigation of climate change and delivery of energy security.

4.3 Local Policy

4.3.1 Tendring District Local Plan

50. Due to strategic cross-boundary policies and allocations, Tendring, Braintree and Colchester's Local Plan share an identical Section 1. Tendring specific policies and allocations can be found within Section 2 of the Local Plan.

51. Section 1 of the local plan (Tendring District Local Plan 2013-2033 and Beyond: North Essex Authorities, 2021) details the direction that the North Essex Authorities, including Tendring District Council wish to take their policies and allocations.

52. Section 2 of the Local Plan used for planning decisions is currently subject to an examination and is available in draft (Tendring District Local Plan 2013-2033 and Beyond Publication Draft, 2017).

53. Objective 7 Historic Environment states that: To conserve and enhance Tendring District's historic environment, including: heritage; respecting historic

buildings and their settings; heritage assets; landscapes; links; and views. Policy SPL3 gives the requirements for Sustainable Design and states with particular relation to heritage that "the design and layout of the development maintains or enhances important existing site features of landscape, ecological, heritage or amenity value".

4.4 Standards and Guidance

54. Standards and guidance is given by the Government on how the historic environment can be enhanced and conserved through the planning process and a number of standard and guidance documents have been produced by Historic England and The CIfA regarding assessing the Historic Environment and implementing a best practice approach. These have been referred to during the compilation of this DBA.

Table 4.1 Standard and Guidance documents relevant to assessment of the historic environment

GUIDANCE	RELEVANT TO ASSESSMENT
Conserving and enhancing the historic environment. (Ministry of Housing, Communities & Local Government (2014, updated 2019)	Sets out advice to ensure the Government's policies on protecting and enhancing the historic environment are understood and followed when making planning decisions. The advice details the main legislative framework for planning and the historic environment, followed by details on how planning decisions should consider the historic environment.
The Historic Environment in Local Plans: Historic Environment Good Practice Advice in Planning 1 (Historic England, 2015a)	Details the processes involved in the decision-making process for the historic environment at a local planning level, providing guidance in implementing the NPPF requirements. Guidance within the document is relevant to ensuring data and documentation for the historic environment is of the standard required.
Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning 2 (Historic England, 2015b)	Provides advice and guidance on assessing the significance of heritage assets, and how to understand the nature, extent and level of significance. It provides guidance on how to understand the impact of a proposed development on the heritage significance of an asset and how to identify ways to avoid, minimise or mitigate that impact which meets the objectives of the NPPF.
The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning 3 (Historic England, 2017a)	Provides guidance on establishing the setting of a heritage asset, how that setting contributes to the asset's significance, and to what extent a proposed development might impact upon an asset's significance.
Standard and guidance for historic environment desk-based assessment (CIfA, 2020)	Provides guidance for the compilation and assessment of baseline historic environment data. It includes guidance on what should and should not be included in a DBA.
Code of Conduct (CIfA, 2014)	Promotes the standards of conduct and self-discipline required of a member in the interests of the public and in pursuit of the study and care of the physical evidence of the human past.
Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC and CIfA, 2021)	Authoritative set of principles that promotes good practice in cultural heritage impact assessment.

5 Historic Environment Baseline

5.1 Introduction

55. The following section details the currently known heritage assets within the study area, which form the baseline data to identify and characterise the historic environment. The full data sets for designated and non-designated heritage assets are included as Annex B and Annex C.

5.2 Location, Topography and Geology

56. The cable landfall search area is located in the south east of the Tendring District in Essex. The area rises gently northwest from the coastline at Holland Haven Country Park to Cook's Green and Great Holland. The present landscape within the cable landfall search area is predominantly characterised by rural fieldscape of pre-19th century and later enclosure, comprising enclosed meadows and reclaimed tidal marshes, with the Holland Brook and various other watercourses crossing and draining the area. Within this rural corridor, the settlement pattern is much more dispersed than the surrounding more densely populated urban areas of Burrsville Park (including Gorse Lane Industrial Estate), Holland-on-Sea, Clacton-on-Sea and Frinton-on-Sea. Few roads cross the area, namely the B1032.

57. The topography within the cable landfall search area rises gently from sea level to 5m above Ordnance Datum (OD) at the coastline and Holland Brook, 10m above OD in the marshy valley around Holland Brooks to 20m above OD at Great Holland, Cooks Green and Little Clacton. The Holland Brook was formerly the Holland River, and its location, along with the valley and the Holland Marshes, denote the former location of the now silted and reclaimed tidal creek known as Gunfleet estuary.

58. Prior to 450,000 years BP the region of modern Clacton was at the confluence of the River Thames and River Medway, the former courses of which both ran across Essex. These rivers were larger, more powerful and heavily braided. At about 450,000 years BP, the Anglian ice sheet moving south diverted the course of these two rivers to approximately their current position. They are largely responsible for the local geology, having deposited large areas of Kesgrave sands and gravels that formed the riverbed. As a result, the geology within the cable landfall search area is London Clay overlain by Kesgrave Catchment Subgroup Sands and Gravels. The Holland Brook valley floor is covered by alluvium. Head deposits are recorded at near Frinton Golf Course and Kirby Brook. Storm Beach deposits are recorded at the coastline.

59. Essex County Council and Tendring District Council have undertaken a study of the geodiversity of the district, which culminated in a GIS data set and accompanying report characterising geodiversity. It has been designed as a tool to support planning decisions and development control in the area. The project was developed primarily to serve as a tool for Tendring District to use in the creation of its Local Development Framework and to facilitate the development of positive approaches to the integration of geodiversity objectives into spatial planning for the District. The results of the *Tendring Geodiversity Characterisation Report* (Essex County Council and Tendring District Council 2009) are summarised below and form a critical resource for better understanding the geoarchaeological resource and its importance.

60. The report provides a detailed analysis of the previous courses of the River Thames and Medway and detailed discussion of underlying geology and overlying soils. An explanation of geologically derived cropmarks is also provided, stating that it is generally confined to generally flat areas of brickearth, and represents the results of Glacial melts.

61. The report identified Geodiversity Character Areas (GCA) and further breaks these down into Geodiversity Character Zones (GCZ), which provide an invaluable understanding of the underlying character of the geology within the cable landfall search area. For the purposes of this DBA the results have been summarised and presented in Figure 2 and in the below sections.

62. The majority of the area falls within GCA 16 Holland Brook, which is further subdivided into GCZs 16.1, 16.2 and 16.3. There are also other localised GCZs within the cable landfall search area including GCZ 5.2, 7.1 and 13.1. All of which are briefly summarised below.

5.2.1 GCZ 5.2 Holland Gravels east of Brightlingsea to Clacton on Sea

63. A small portion of this character zone is located within the cable landfall search area in the vicinity of Sladbury's Farm. The Holland Gravels correlate with the lowest of the four Kesgrave formations on the Tendring Plateau. The band of gravels was deposited by an earlier course of the Thames downstream of the confluence with the Medway system. The gravel body records the change from sediments deposited by a pre-Anglian river to those having an input of Anglian glacial outwash. These gravels cross the southern part of the District trending west-east towards the southeast coast.

5.2.2 GCZ 7.1 Deposits of Cooks Green Gravels along the valley sides of the Holland Brook

64. The Cooks Green Gravels correlate with the third highest of the four Kesgrave Members on the Tendring plateau and are contemporary with the Wivenhoe Gravel. The Cook's Green Gravels represent course-grained sediments deposited beyond the confluence of an earlier course of the Thames and Medway rivers. These gravels are thought to have been deposited under cold climate conditions around 500,000 years ago. The zone covers the gravels along the valley sides of the Holland Brook.

5.2.3 GCZ 13.1 London Clay plateau covering the northeast and southeast of the District

65. London Clay plateau covering the north-east and south-east of the District surrounding the Oakley Ridge in the north and Holland Brook in the south to the coast at Frinton.

5.2.4 GCZ 16.1 Alluvial deposits within the floodplain valley of the Holland Brook

66. The freshwater alluvial deposits exist upon the narrow floodplain within the tributaries and along the length of the Holland Brook valley.

5.2.5 GCZ 16.2 Estuarine alluvial deposits within the lower reaches of the Holland Brook and Holland Haven marsh

67. Estuarine alluvial deposits occur within the widening floodplain of the lower reaches of the Holland Brook. The floodplain opens out into Holland Haven Marshes at the coast.

5.2.6 GCZ 16.3 London Clay slopes of the Holland Brook valley

68. London Clay is exposed along the steep valley sides of the Holland Brook valley and tributary valleys.

5.3 Designated Assets

69. There are 166 designated heritage assets within the 5km study area (see Annex A Figure 3 and Annex B), comprising six Scheduled Monuments (SMs) (**1-6**), two Registered Parks and Gardens (**7-8**), 153 Listed Buildings (**3-4** and **9-159**) and eight Conservation Areas (**160**-**166** and **227**). This section provides a short summary of these designated heritage assets. As the project intends to avoid all designated heritage assets, no direct physical impacts are anticipated to occur. These assets will therefore predominantly form part of the settings assessment in the wider PEIR and ES, in which they will be considered in greater detail, so that any non-physical impacts associated with a change in setting resulting from the project's operation can be more fully understood.

5.3.1 Scheduled Monuments

70. There are no Scheduled Monuments within the cable landfall search area. There are six within the 5km study area (Figure 3). All these monuments have been scheduled due to their national importance and significance (incorporating archaeological and historic interest) and can often form a primary part of the historic landscape or townscape character of the local area.

71. The remains of Little Holland Parish Church and cemetery (**1**) are located within 300m of the cable landfall search area within the grounds of Little Holland Hall, at Holland-on-Sea. The buried remains of the church and cemetery form part of a manorial complex which, until recently, was isolated from other settlement. Other surviving components of the manor include the hall itself and two large ponds; which are not included in the scheduling.

72. The 19th century Beaumont Quay (**2**) is located over 4km to the north of the cable landfall search area. The remaining Scheduled Monuments relate to coastal defences built during the Napoleonic and Second World Wars, namely three Martello Towers (**3-5**), two located in Clacton-on-Sea and one in Walton, all over 3.5km from the cable landfall search area. The WWII Bombing decoy (**6**) is located over 4.5km to the north, beyond Kirby-le-Soken.

73. All of the monuments can be identified as being of high heritage importance, with significance being derived from their archaeological and historical interest.

5.3.2 Registered Parks and Gardens

74. There are no Registered Parks and Gardens within the cable landfall search area. There are two Grade II Registered Parks and Gardens within the 5km study area. The designation at Thorpe Hall (**7**) is located over 2km to the north of the cable landfall search area and comprises an early 20th century shrub and water gardens developed by the owner, Lady Byng, from 1913 onwards. It is located over 2km north of the cable landfall search area at Thorpe-le-Soken.

75. Clacton Seafront Gardens (**8**) were laid out to a design by the County Surveyor, Daniel Bowe, in 1921. They are located within the urban area of Clacton-on-Sea over 3km to the west of the cable landfall search area.

76. Both are considered as being of high heritage importance, with significance being derived from their archaeological and historical interest.

5.3.3 Listed Buildings

77. Of the 153 Listed Buildings, four are located within the cable landfall search area, all of which are Grade II listed timber framed farmhouses. Treasure Holt Farm (**9**) dates to the early 17th century, Sladburys Old House (**10**) and contemporary timber framed cartlodge (**11**) date to the 18th century and Great Holland (**12**) is 19th Century.

78. There is one Grade I Listed Building, the Church of St John the Baptist (**136**) which has its origins in the Medieval period and is located in Great Clacton, approximately 1.5km to the west of the cable landfall search area. There are 12 Grade II* Listed Buildings across the 5km study area, seven of which are churches and 5 of which are houses. The Grade II* All Saints Church (**13**) in Great Holland is located within 100m north of the cable landfall search area. The Parish church was rebuilt in 1866 by Sir Arthur Blomfield, but the west tower dates to at least the 15th century. The Grade II* Homestead (**18**) is located within 500m of the cable landfall search area and comprises a two storey 20th century house.

79. The remainder are Grade II Listed Buildings either concentrated in historical towns and / or settlements adjacent to the cable landfall search area, such as Great Holland, Little Clacton, Great Clacton, Thorpe-le-Soken, Kirby-le-Soken and Walton-on-the-Naze or dispersed farm houses located within rural or semi-rural areas.

80. The Grade I and II* Listed Buildings are certainly considered to be of high heritage importance to the local area and wider region, adding to the distinct quality and character of historic non-designated settlements and Conservation Areas, as well as the wider environment, particularly through shared intervisibility between buildings with vertical dominance (e.g. parish church spires).

Table 5.1 Listed Buildings within the cable landfall search area

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)
9	1111548	TREASURE HOLT FARMHOUSE	Burrsville, Tendring, Essex, CO15	II	20/08/1976	TM 19220 17541
10	1111521	SLADBURY'S OLD HOUSE	Burrsville, Tendring, Essex, CO15	II	04/07/1986	TM 19681 18088
11	1337148	CARTLODGE OPPOSITE AND APPROXIMATELY 30 METRES NORTH WEST OF SLADBURY'S OLD HOUSE	Burrsville, Tendring, Essex, CO15	II	04/07/1986	TM 19792 17924
12	1337116	GREAT HOLLAND LODGE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 21144 18749

Table 5.2 Listed buildings within immediate proximity of the cable landfall search area

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)
13	1165610	CHURCH OF ALL SAINTS	Frinton and Walton, Tendring, Essex, CO13	II*	21/06/1950	TM 21918 19356
14	1337117	TUDOR COTTAGES	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21458 19355
15	1165657	MANOR FARMHOUSE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 21298 19246
16	1317222	HOUSE NOW KNOWN AS RING COTTAGE AND TUDOR COTTAGE TO THE NORTH EAST OF FORMER CHAPEL AND WEST OF TRACK TO NATURE RESERVE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 20358 19001
17	1111532	GREAT HOLLAND MILL HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM2036419333
18	1111531	THE HOMESTEAD	Frinton and Walton, Tendring, Essex, CO13	II*	18/05/1979	TM 23353 19396
19	1111530	CHURCH OF ST MARY	Frinton and Walton, Tendring, Essex, CO13	II*	21/06/1950	TM 23718 19483

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)
112	1337144	PARKGATE FARMHOUSE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 18207 19273
113	1165880	REEDLANDS FARMHOUSE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 17751 18893
114	1111523	OAK HOUSE	Burrsville, Tendring, Essex, CO16	II	04/07/1986	TM1799118459
115	1111551	WILLOW FARMHOUSE	Burrsville, Tendring, Essex, CO15	II	04/07/1986	TM1854918142
116	1337124	THE ROBERT BURRE	Burrsville, Tendring, Essex, CO15	II	10/01/1951	TM 18671 17419
117	1165560	THE OAKWOOD INN	St. Bartholomew's, Tendring, Essex, CO15	II	04/07/1986	TM 20218 16792
118	1111529	LITTLE HOLLAND HALL	St. Bartholomew's, Tendring, Essex, CO15	II	26/10/1973	TM 20876 16690

5.3.4 Conservation Areas

81. There are no Conservation Areas within the cable landfall search area. There are eight Conservation areas within the 5km study area. Great Holland and Frinton Conservation areas are within immediate proximity to the cable landfall search area. The remainder are located over 2.4km from the cable landfall search area and are summarised in the table below.

Table 5.3 Conservation Areas within the 5km study area

NFID	NAME	SPECIAL CHARACTER
160	Great Holland	The special character of Great Holland Conservation Area lies in the relationship between a formal, enclosed area in front of the Ship Inn and the sinuous lane leading to the Church, Hall and extensive views over the coast.
161	Frinton	Frinton as a planned resort dates from the end of the 19th century, with its heyday some 30 years later. It contains many fine examples of English domestic architecture of the period, set in a spacious residential suburb, and linked to a famous main street and an important open space on the sea front. The extensive Area includes these important locations and much of their general setting.
162	Great Clacton	Great Clacton Conservation Area represents the centre of the old village, now surrounded with housing development from the expansion of Clacton, but retaining its function as a focus for the surrounding community. It derives its character from this service, most notably represented by the fine church and three old inns. Other historic buildings provide a focal point south west of the church.
163	Clacton Sea Front	The special character of Clacton Seafront Conservation Area is derived from its seaside architecture and formal planned street pattern. The Area is the heart of the coastal resort and includes Victorian and Edwardian seaside buildings that were part of the early planned development of the resort, as well as formal gardens and pavilions, and important landmarks like the Martello Tower F and the Pier.
164	Kirby-le-Soken	The special character of Kirby-Le-Soken Conservation Area rests in the sinuous layout of The Street and the relationships between the wide variety of buildings associated with it, from the parish church and larger houses to smaller cottages and cabins.
165	Thorpe-le-Soken	The special quality of Thorpe-Le-Soken Conservation Area derives ultimately from its importance in Medieval times, indicated by the wealth of historic buildings lining a sinuous main street. Neighbouring parts of the village that relate to the Medieval core in plan form and in the intrinsic interest of their buildings are also included in the Area because of their supporting role. The Area contains a wealth of mature trees which frame buildings and spaces and contribute to its character and appearance.
166	Walton	Walton is in essence a resort developed from the mid-19th century. It retains an interesting street plan and a wealth of buildings whose understated qualities are only now being recognised. The Area is focussed on the seafront and the main surviving sections of the original resort.
227	Thorpe-le-Soken Station and Maltings	Thorpe-Le-Soken Station and Maltings Conservation Area contains a distinctive collection of buildings, most notably a listed Maltings, relating to the commercial and social changes consequent on the opening of the railway over 130 years ago. The future of these buildings is uncertain, and their settings marred by inadequate maintenance. Conservation area designation is regarded as important in supporting these historic buildings in any discussions concerning change and improvement. The Area also contains a small group of workers' cottages south of the railway line. It is recommended that these are removed from the Area because they are much altered and visually isolated from the rest of the Area.

82. These Conservation Areas are identified as being of high heritage importance to the region, adding to the historic character of the landscape and townscapes.

5.3.5 Ancient Woodland

83. Seven sections of Ancient Woodland are identified by Natural England within the 5km study area. Ancient Woodland is any woodland that is older than AD1600 (Forestry Commission & Natural England, 2014). Ancient woodland has an inherent heritage interest, often contributing to the setting of other nearby heritage assets and having the potential to provide evidence of historic coppicing and other woodland industries (e.g. charcoal or iron production). No such evidence is identified within the EHER data within the cable landfall search area.

84. Similarly, sections of ancient woodland can add greatly to an area's historic landscape character, and often enhancing the setting of heritage assets. As such they can form a useful addition to the baseline data.

85. The majority of ancient woodland within the 5km search area is located over 3km from the cable landfall search area. Only Holland Hall Wood is located within immediate proximity, as such no further consideration of ancient woodland has been made in the present DBA.

Table 5.4 Ancient Woodland within the 5km study area

NF ID	NAME	TYPE	AREA (HA)	NRG	DISTANCE
1117236	HOLLAND HALL WOOD	Ancient & Semi-Natural Woodland	5.32	TM 22046 19574	0.18km
1117158	HARTLEY WOOD	Ancient & Semi-Natural Woodland	27.46 2.05	TM 15106 17622 TM 15413 18232	3.6km
1117159	COPPINS HALL WOOD	Ancient & Semi-Natural Woodland	2.35	TM 15587 16163	3.6km
1117170	WEELEY HALL WOOD	Ancient & Semi-Natural Woodland Ancient Replanted Woodland	27.89 3.36	TM 15902 20963 TM 15510 21097	3.8km
1122634	ISLAND GROVE	Ancient & Semi-Natural Woodland	3.96	TM 15552 21804	4.8km
1117157	MALDON WOOD	Ancient & Semi-Natural Woodland	13.82	TM 14347 19606	4.9km
1420106	n/a	Ancient & Semi-Natural Woodland	0.67	TM 15795 22048	4.9km

5.3.6 Registered Battlefields

86. There are no Registered Battlefields within the 5km study area.

5.4 Non-designated heritage assets

87. All HER data has been compiled into a gazetteer Annex C and the sub-sections below identify the known remains most relevant to the cable landfall search area with additional information provided where available from archaeological reports, HER event record data, data held on the ADS and results from *The Tendring District Historic Environment Characterisation Project* (Tendring District Council and Essex County Council 2008) and the *National Mapping Programme Essex: Management Report* (Essex County Council and EH 2003).

88. Within the cable landfall search area, there are a total of 64 HER records describing findspots (14), monuments (41), industry (1), landscape features (3) and Listed Buildings (4) (Figure 4 and Annex A). The Listed Buildings on the EHER have been assigned the same NFID number given in the designated assets Gazetteer to avoid duplication.

5.4.1 Palaeolithic

89. Palaeolithic deposits from the wider Clacton area have produced a range of flint tools and the oldest wooden tool ever recovered from Britain. The deposits are of international importance and as such the name 'Clactonian Industry' is given to the evidence for production and typology of tools recovered from this region dating to 300,000 – 200,000 years BP. The Palaeolithic deposits also provide a rich source of information on the past environment, habitats, flora and fauna. The only recorded evidence for this period within the cable landfall search area are three worked flints (**167**) broadly dated to the Palaeolithic to Bronze Age periods, found during a walkover survey in advance of the extension to Oakwood Business Park in 1998.

5.4.2 Mesolithic

90. In the wider area, evidence from the Mesolithic period can largely be characterised by significant assemblages of microlith stone tools, particularly around Walton-on-the-Naze, which attest to the presence of transient groups relying on wild game and fishing for subsistence. The sea levels began to rise during this period due to glacial melt and by the Mesolithic period there was probably a tidal estuary (**168**) within the cable landfall search area, which occupied the area of low, flat, marshy land in the vicinity of the current Holland Brook (former Holland River). The estuary was known as the Gunfleet estuary from the Medieval period onwards. The estuary extended broadly along the line of the Holland Brook and surrounding marshlands and narrowed as it stretched northwest inland. It probably extended well beyond the present location of Fan bridge on the road between Great Holland Common and Cook's Green (Little Clacton), and may have been tidal as far as Weeley and navigable to smaller boats up to Thorpe-le-Soken further north.

5.4.3 Neolithic

91. Neolithic activity is well attested across the wider Tendring District and is evidenced by cropmarks of a monumental causewayed enclosure at St Osyth

and ring ditch at Brightlingsea, which together have yielded one of the largest collections of early Neolithic ceramics of the East of England. Evidence suggests that during this period the population begins to move to a more settled agricultural existence. The sea level was still relatively much lower during this period, and settlement evidence has been recovered from what is now the intertidal zone at Clacton, Stone Point and Walton-on-the-Naze. Within the cable landfall search area Neolithic findspots are concentrated to two polished axe heads (**169** and **170**) found to the south of Great Holland, indicating at least, a presence in the area during this period.

5.4.4 Bronze Age

92. Evidence for Bronze Age activity in the wider area can be characterised by Beaker pottery, barrows and cremation cemeteries. A locally distinctive form of pottery and funerary tradition has been recovered from cremation cemeteries at Ardleigh, Brightlingsea, Lodge Farm and Little Bromley in the wider Tendring Area, with cremations being placed between barrows in large straight sided elaborately decorated Bucket Urns (evident as ring ditches). Burials have also been found eroding from modern cliff faces north of Walton, which would have still been a distance from the coastline during the Bronze Age.

93. Within the cable landfall search area, at least four findspots within Great Holland demonstrate Bronze Age activity and include: a folded gold ribbon (**171**), two Bronze Age axe heads (**172** and **173**) and a mace head (**174**). A number of possible ring ditches (possible Bronze Age barrows) have been identified within the cable landfall search area as crop marks at Cook's Green Farm (**215**), Burrsville Park (**217**) and Great Holland (**222**) (undated cropmarks are discussed in greater detail below in Section 5.4.11**,** with further detailed analysis being carried out by APS, see Annex D). The EHER records them as undated, as they have not been excavated and sit within a landscape that contains various cropmarks, some of which are attributable to underlying geological conditions. However, the ring ditch cropmarks are usually a fair indication of underlying Bronze Age Barrows and given the nature of findspots at Great Holland, their presence is likely.

94. Slightly more definitive evidence for Bronze Age activity was identified during extensive archaeological evaluation (**216**) undertaken on land immediately adjacent to the north-western limit of the cable landfall search area prior to a housing development to the north of Oakwood Business Park. The evaluation identified several small undated pits containing Bronze Age pottery and burnt bone, which were tentatively identified as human and these could possibly indicate the presence of Bronze Age cremation burials.

95. Flints broadly dated to the Prehistoric period have also been found at Treasure Holt Farm (**175**).

5.4.5 Iron Age

96. Evidence for Iron Age activity in the wider area is characterised by dispersed domestic and agricultural settlements, field systems, cremation burials and red hills (salt production). Evidence from sites such as St Osyth (6km to the west) suggest arable and pastoral farming were practiced, with the lower lying salt

marshes being used for grazing. Wool production likely also formed part of the local economy, which was probably heavily influenced by the Trinovantes tribe, whose capital was located in the nearby nationally significant Iron Age settlement of Camulodunum (near modern Colchester over 16km to the north-west). A comprehensive account of Essex red hills is given in *The Red Hills of Essex: Salt-making in antiquity* published by Colchester Archaeological Group.

97. The only recorded Iron Age evidence within the cable landfall search area are an Iron Age ditch (containing daub, prehistoric pottery and slag) and a residual loom weight (**176**), the latter was found in the context of a Medieval structure. The features were identified during an archaeological watching brief and excavation near Cook's Green during the EDF Energy Networks cable route ground work in Little Clacton. It was noted that the Iron Age ditch had already been identified on the NMP and was in line with modern field boundaries, suggesting that there is some potential for undated cropmarks and some modern field boundaries to have origins in the Iron Age.

5.4.6 Roman

98. Evidence from the Romano-British period in the wider area suggests a dispersed settlement pattern with an associated agricultural landscape with localised industries. The Roman town at Colchester would also have heavily influenced land use, settlement pattern and economy in the area. A number of villa sites have been identified at St Osyth, Little Oakley and Dovercourt (all located over 6km from the cable landfall search area).

99. Within the cable landfall search area only a residual sherd of Roman greyware pottery (**177**) has been identified at Oakwood Business Park. No other Roman evidence is recorded within the cable landfall search area at present.

5.4.7 Early Medieval

100. Evidence from the Saxon period is generally sparse in the wider area, suggesting either continued occupation or reoccupation of previously abandoned villas and farmsteads, such as those at St Osyth. The name of which derives from the dedication of a minster church to Osyth, daughter of a Saxon King. Evidence for Middle Saxon domestic settlement and activity have been recovered from the Clacton area. The scheduled remains of a parish church at Little Holland Hall (**1**) likely have origins in the Anglo-Saxon period. Later Viking evidence is rare in Essex as a whole, but place name evidence at Kirkby-le-Soken and Thorpe-le-Soken, to the north of the cable landfall search area, are Danish in origin suggesting at least a general presence in the area.

101. A cropmark field boundary at Bonds farm, within the cable landfall search area has been tentatively dated to the Early Medieval period (**178**).

5.4.8 Medieval

102. Settlement patterns and activities in the wider area remained dispersed during the Medieval period, with villages, hamlets and farmsteads providing settlement foci in an otherwise rural and agricultural landscape. Moated sites are common in Essex, but less so in Tendring. The nearest Medieval moated hall is recorded

at Gutteridge Hall, over 5km to the northwest of the cable landfall search area. Medieval activity is well attested at St Osyth and Great Bentley, where the remains of a windmill were identified and represents another relatively characteristic structure of Medieval Essex and as such a smock mill was located in Great Holland. Tidal mills were a common feature along this stretch of coastline, though none are recorded on the EHER within the cable landfall search area.

103. Coastal trade likely formed an important, if not key aspect of the local economy during the Medieval period. Harwich (over 12km to the north-east) represents the main hub, with smaller sites at St Osyth and along the Rivers Stour and Colne. Within the cable landfall search area coastal trade was on a much smaller scale, but fed into the wider economy during this period. There are seven presumed landing places recorded along the line of the former Holland River (**179-185**). They likely represent lanes that linked the Gunfleet estuary to the farms and villages on the higher land, allowing crops and other local produce to be loaded easily onto boats and carried along the river for trade in the wider area and into London. Remote landing places could also be used to avoid customs control and the isolated marshes at Holland earned a reputation for smuggling which carried on until the 17th century after the estuary had been reclaimed.

104. The Medieval period saw the beginning of substantial episodes of reclamation of areas of saltmarsh at Holland Marshes (**186** and **187**), which continued on into the Post Medieval period, with the construction of embankments and ditches to hold back the sea so the land could be used and improved for grazing nearer the coast and arable farming or the production of hay further inland to the north.

105. The earliest recorded evidence of a bridge crossing Holland Brook at the marshes is recorded at Fan Bridge (**188**) in 1509 and shown on Norden's map of 1594. The name 'Fan' or 'Fann' is derived from fen or marsh. The bridge has since been variously demolished and rebuilt and the present brick structure dates to the early 20th century.

106. Cropmarks within the cable landfall search area have also been dated to the Medieval period and attest to a continuation of domestic and agricultural activity. At Little Clacton undated cropmarks and a small rectangular Medieval structure with a hearth or possible oven base (**189**) were partially excavated during EDF cable works. Other cropmark features attributed to the Medieval period include a trackway south of Great Holland Lodge (**190**) and field boundaries at Burrsville Park (**191**) and Great Holland (**192** and **193**). Generally, field types of this period included common-fields sub-divided long before parliamentary enclosure, former deer parks and demesne fields, which were divided and hedged in the late Medieval and Tudor period.

107. There are very few Medieval findspots within the cable landfall search area. Medieval pottery (**194**) was found during a walkover survey to the north of Oakwood Business Park, but was attributed to later agricultural activity, rather than domestic evidence. The only other recorded find is a cast copper alloy sword pommel with remains of the iron hilt (**195**) found in the Great Holland area.

5.4.9 Post Medieval

108. During the Post Medieval period settlement patterns become much more dense at Great Clacton and Walton-on-the-Naze as a result of growing industries, trade and economy, which is reflected in the EHER records by; a findspot of a trade token (**169**) from Sudbury dating to 1669 within the Great Holland area and a silver coin hoard (or dropped purse) deposited in the 17th Century (**197**).

109. One of the key industries in this area was the production of Iron Sulphite which could be used to make dye, ink and sulphuric acid. The EHER records one such Copperas Works (**198**) at Holland Haven. The works belonged to a Mr Barton and were recorded on an 1783 plan of the Tendring Levels. The process involved gathering copperas stones (iron pyrites) that had washed out of the London Clay onto the shore, stacking them and leaving them to weather until they became copperas (green vitriol) and a toxic liquid leached out into settling ponds where it could be collected. The settling ponds are still visible on Holland Haven on the marsh side of the sea wall, though no Copperas House has been identified.

110. The upper/northern reaches of the Gunfleet estuary had silted up by this period. The salt marsh at Holland Haven was enclosed and drained during the 17th century and Holland Brook was embanked between Holland Bridge and Holland Haven in the 18th century. Holland bridge (**199**) was the last of the three bridges (Rice Bridge at Thorpe-le-Soken, Fan Bridge and Holland Bridge) to be built across Holland Brook and was also built by at least the 18th century, though the current bridge is early 20th century in date.

111. The Essex Historic Grazing Marsh Project (Essex County Council 2014) identifies two areas of surviving historic grazing marshes within Holland Haven Country Park and along the north eastern edge of Holland-on-Sea. They are defined as areas 51.1 and 51.2. The smaller of the two areas, 51.1, is located between the car parking area and sea wall and comprises heavily improved grass land and relict salt marsh dating tho the 18th century or later. The larger area, 51.2, is comprises Holland Haven Marshes and part of the marshland extending westwards along Picker's Ditch. Most of the marsh land surrounding Holland Brook is thought to have been reclaimed prior to the 17th century, however, cartographic sources from this period show the mouth of the Holland Brook open to the sea. The Essex Historic Grazing Marsh Project report states that it is likely that emabnskment of Holland Brooks take place in the 18th century in this area, up to Holland Bridge, but below this point there was an embankment north of the stream, which protected the marshes of Great Holland, but to the south there may have been open saltings. Much of the original area survives under grass, although there is evidence for extensive improvements with drainage, including surface drains, and straightening of boundary ditches, which remain water filled. At least two periods of reclamation are evident from the surviving sea walls along the small river channel, which remain as earthworks in many places. The report states that relict salt marsh surface is visible in some places, with former creeks and rills defined in the different vegetation. It also notes there are documentary records for a landing place called Gunfleet Quay (Essex County Council, 2014).

112. The EHER also records the Grade II listed timber framed farmhouses and associated structures ranging in date from the 17th to the 19th centuries including Sladburys Old House and cartlodge (**9** and **10**), Treasure Holt Farmhouse (**11** and **200**) and Great Holland Lodge (**12**).

113. The importance of coastal defence increased dramatically during the end of the Post Medieval period, with the advent of the French Revolution and resultant Napoleonic Wars. In response, a series of Martello Towers were built along the coastline. Two of which, Towers G and H (**201** and **202**) were built and subsequently demolished in the early 19th century within the cable landfall search area. The towers were built to defend Holland Marshes as part of the wider British coastal defences during the Napoleon Wars. Martello Towers housed large artillery and a battery of soldiers, but the developments in rifled artillery made the towers obsolete very quicky, hence the demolition of these examples within the cable landfall search area. Tower G was located on a small hill near Sluice House, and its site is still known as Tower Hill. Tower G was located near what is now the centre of the Frinton Golf Course. Tower H was the only one in Essex that did not have a supporting battery.

5.4.10 Modern

114. Coastal defences continued to be variously built and decommissioned within the cable landfall search area during the Modern period with the advents of the First and Second World Wars (WWI and WWII). The location of a now demolished WWI pillbox (**203**) has been recorded as destroyed to the north of Smythies' Farm. A series of WWII pillboxes are also recorded within the cable landfall search area. Several pillboxes were built into the sea walls at Holland Haven, but only one is still fully standing (**204**), one is a base only (**205**) and the rest have been demolished (**206, 207** and **208**). Another pillbox still stands in Holland Country Park (**209**) and at least partial remains of two are recorded near Clacton Road (**210**).

115. Two heavy anti-aircraft gun sites (**211**) and a possible 'Diver' anti-aircraft battery (**212** and **213**) are recorded in the cable landfall search area. At the gun sites (**211**) no visible remains are recorded at either location. It is possible that the site only consisted of the gun itself with sand bag emplacements and a tent. The Diver sites (**212**) form part of a Diver camp built in 1944 in response to the V1 bombing of England. An aerial photograph taken in July 1946 shows the area on the east side of Clacton Road, Great Holland in a field by a sharp bend. The presence of around 25 buildings were indicated by Nissen huts and parch marks of the four in-line gun platforms and control huts. The second Diver site was located at the present location of Frinton Golf Course. An aerial photograph dated to 1946 shows the patch marks indicative of accommodation huts, access roads and interconnecting paths, probably amounting to 23 structures, in the field to the south west of the Club House. No parch marks of the gun platforms were identified. It is possible that the establishment of the Golf Course may have impacted any surviving below ground remains.

116. A WWII minefield (**214**) was also located at Holland Gap Marshes, to the east of Holland Bridge. The field was cleared of explosives after the end of WWII, though some craters of exploded mines had previously been identified on the EHER record.

5.4.11 Undated

117. The EHER records a series of undated cropmarks and findspots within the cable landfall search area. They are generally concentrated on the higher ground at the north and west of the cable landfall search area, where the ground is drier and beyond the former location of the Holland River and Gunfleet estuary. The information presented below is a summary of information held by the EHER and NMP. APS have carried out a comprehensive review of the cropmark data and provided more detailed analysis, which, in some cases allowed for re-interpretation of some of the data (Annex D, APS 2021). The APS report should be considered the most up to date representation of cropmark data within the cable landfall search area.

118. To the south of Cook's Green Farm (**215**) cropmarks of four dispersed ring ditches have been identified, along with linear features possibly representative of a former field system, including part of an oval enclosure and a rectangular enclosure. Extensive pits have also been identified.

119. Extensive archaeological evaluation in advance of a housing development to the north of Oakwood Business Park (**216**) identified a focus of two small, undated pits containing small amounts of burnt bone, two pieces of which are tentatively identified as human long bone. It is possible therefore that these were Bronze Age cremation burials.

120. To the north of Burrsville Park (**217**) a series of cropmarks have been identified, including double ditched trackways, pits and ring ditches, however, the EHER notes that cropmarks of extensive geology could be masking some archaeological features including a possible enclosure.

121. Cropmarks of undated linear features (**218**) have been identified near Smythies Farm and Pond Farm. Further to the west of Smythie's Farm (**219**), immediately outside the cable landfall search area various other cropmarks have been identified and include a former field system visible on the 1967 OS map, a double ditched trackway or drainage ditches, a ring ditch and a scatter of pits.

122. There is a particular concentration of cropmarks identified to the south of great Holland. The EHER records three areas surrounding Manor Farm. The cropmarks in the field to the southeast (**220**) include features mainly identified as geological in origin, but some linear archaeological features and pits are discernible on aerial photography.

123. In the area to the south of Manor Farm (**221**) the former field boundaries are associated with **220** and have been mapped as part of the NMP, however, the cropmarks in this area were not added to the NMP as they are more likely to be geological in origin.

124. In the areas to the southwest of Manor Farm (**222**), however, the cropmarks of a possible prehistoric rectangular enclosure and trackways have been identified and include; a broad double ditched trackway aligned almost north-south, a series of possible pits in a circular formation, pits scattered across field and two narrower double ditched trackways aligned southwest-northeast. The EHER also records penannular ditches, which were not identified during the NMP survey.

125. Further south in the vicinity of Holland Haven (**223**) an undated circular earthwork is recorded on the EHER and possibly represents the remains of the red hill identified within the grazing marsh (**186**) and former Copperas works at Holland Haven, however, the NGR given places the record in the sea and little further information is available.

126. An undated oval mound (**224**) is recorded in the north-western corner of the field to the north-west of Fan Bridge. It measures approximately 20m by 30m and is located on the flood plain/former estuary. There is an adjacent corresponding excavated area or depression, though the area has been used for dumping since the 1950s. The EHER suggests it may have had its origins as a hard or hythe on the estuary edge.

127. Record **225** represents a negative result for archaeological monitoring during Little Holland Brook Flood drainage works, but possible cut and laid brushwood was observed in the section beside a large shoring for a man-hole shaft about 5m deep. Above the layer of brushwood was a layer of dark humic peat overlain by blue-grey clay.

128. Record **226** represents the negative result of a field walking and geophysical survey at Oakwood Business Park, noting an overall low density of finds from the site. The finds probably were a result of agricultural practice rather than settlement.

5.5 Previous Archaeological Investigations

129. A number of archaeological investigations have taken place within the cable landfall search area, some of which are already detailed above in the EHER data, therefore, this section provides a brief summary of the nature and type of assessments/surveys undertaken which have informed the known archaeological record and therefore enhanced our understanding of the historic environment in this area.

130. At the western limit of the cable landfall search area a programme of archaeological works including a desk-based assessment and field walking and geophysical survey were undertaking by Lindsey Archaeological Services in 1997 to the north of Oakwood Business Park (LAS, 1997). No archaeological features were identified, only finds likely derived from agricultural activity were identified.

131. However, to the immediate west, outside the cable landfall search area extensive archaeological evaluation was undertaken prior to a housing development to the north of Oakwood Business Park. The evaluation was undertaken in 2019 by Archaeology South-East (ASE, 2019). Eighty-five evaluation trenches were excavated across the c.12ha site, the trenches being distributed to achieve a random sample. ASE identified several small undated pits containing Bronze Age pottery and burnt bone, which were tentatively identified as human and these could possibly indicate the presence of Bronze Age cremation burials. Three sherds of residual Middle Bronze Age pottery were found in a Modern pit, in the centre of the site. A north–south ditch in the southwest corner of the site, perhaps part of a field/enclosure system, produced a small amount of earlier Roman pottery. Another sherd of possible Roman pottery occurred residually in a probable Post Medieval field boundary ditch. An

apparent focus of Medieval activity in the southeast corner of the site was represented by several ditches containing moderate amounts of late 12th- to 13th century pottery and some lava stone quern fragments. The extent and function of the ditches are unclear; they might have been field/enclosure boundaries or drainage features. The associated finds assemblage suggests that there was occupation nearby, although no structural or obviously domestic features were found. The Post Medieval ditches corresponded to east–west field boundaries shown on historic mapping.

132. Archaeological monitoring and excavation was carried out by Colchester Archaeological Trust during the EDF Energy Networks cable route at Little Clacton in 2009 (CAT, 2009). An 11 km-long cable was laid by the contractor from Sackett's Grove Caravan Park (Clacton-on-Sea) to Cook's Green (Little Clacton). For most of this route, the cable was laid along existing roads or in existing ducts. Where the cable crossed open fields, i.e. for 1.7km of the route, the stripping of the easement was monitored by the Colchester Archaeological Trust. Where monitoring revealed archaeological features, these were excavated and recorded. Evidence for prehistoric occupation consisted of an Iron Age ditch, and a residual Iron Age loomweight fragment. There were no Romano-British finds. The most important archaeological feature was the site of a small, Medieval rectangular structure with a burnt patch which was either a hearth or the base of an oven. It is not clear whether the structure was domestic or agricultural in function, or whether it was permanently or only occasionally occupied. An adjacent, right-angled gully appeared to be part of a similar Medieval structure. Two ditches forming part of an adjacent cropmark site were excavated where they crossed the easement. One was undatable, but the other was probably of Post Medieval date and had been infilled within living memory.

5.6 Historic Landscape Characterisation

133. The Historic Landscape Character (HLC) data held by the EHER has been obtained and included within the North Falls GIS project database, see Figure 5**,** which displays the broad HLC groups which the cable landfall search area crosses, as described in the report: Lynn Dyson-Bruce, Alison Bennett (2013) *Essex Historic Landscape Characterisation Project (HLC)*.

5.7 Tendring District Historic Environment Characterisation

134. This section forms a summary of the result of *The Tendring District Historic Environment Characterisation Project* (Tendring District Council and Essex County Council 2008), the data from which has been provided separately by Place Services (Essex County Council) on 23rd July 2021. This data was produced as an aid in the interpretation of the current landscape history and evolution and forms an aid to identifying areas of the landscape which may be sensitive to change. It should be noted that due to the nature of the data, in some cases the HLC character polygons extend beyond the parameters of the cable landfall search area. As such, more localised character types summarised below may lie beyond the area assessed in this review. Where possible, this is noted in the following discussion.

135. Each character zone (HECZ) has been scored on a range of criteria for which separate scores are retained within the GIS metadata. The following system is

based on scoring developed for the English Heritage Monuments Protection Programme (MPP); modified to consider broad zones rather than particular monuments. This method of scoring is intended as a simple means of engaging with issues of sensitivity, value and importance. It is not designed to be definitive and is likely to be subject to change as new information becomes available and understanding develops. Seven criteria have been used:

- Diversity of historic environment assets
- Survival
- Documentation
- Group Value Association
- Potential
- Sensitivity to change
- Amenity Value

136. Each of the criteria have been scored for each of the zones with a rating of 1, 2, or 3 with 1 as the lowest and 3 as the highest.

137. The cable landfall search area is situated within four distinct sub character areas of the wider South East Tendring Plateau and the Sokens (HECA 6). The relevant areas are; Great Holland (HECZ 6.4), Little Clacton (HECZ 6.5) Holland Brook Floodplain (HECZ 6.6) and Holland Haven (HECZ 6.7) (see Figure 6).

5.7.1 Great Holland HECZ 6.4

138. Approximately 1/3 of this zone falls within the cable landfall search area. The character zone extends beyond the northern limit of the cable landfall search area up to Thorpe-le-Soken.

139. Great Holland comprises an agricultural landscape, open in aspect, with extensive views eastwards to the sea. The fieldscape comprises a mixture of rectilinear fields of ancient origin and some later enclosure. There has been boundary loss (see also HLC data, Figure 5), some post-1950s and some much earlier. The settlement pattern of the zone is historically highly dispersed, comprising a church/hall complex at Great Holland, a scattering of cottages around the greens and at road junctions and a number of isolated halls and farms. Gradual infilling of the settlement in the older village and around the heath had occurred by the end of the 19th century, this area now forms the Conservation Area and further infill and expansion has taken place throughout the 20th century.

140. There has been little archaeological fieldwork done in this zone, though groups of cropmarks have been identified, some of which may relate to later Prehistoric or Roman settlements and Bronze Age cemeteries, others are Medieval to Post Medieval field boundaries and the remainder are the results of a Heavy anti-aircraft battery.

Table 5.5 Great Holland HECZ 6.4

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Range of multi-period cropmarks, settlement pattern, WWII defences	3
Survival	Cropmarks indicate good survival of multiperiod below ground deposits, settlement pattern survives well	3
Documentation	HER data, cartographic evidence, NMP	2
Group Value Association	Cropmarks, settlement pattern, WWII defences	3
Potential	Good potential for below ground archaeological deposits	2
Sensitivity to change	Sensitive to change due to historic settlement pattern and below ground deposits	2
Amenity Value	Cropmarks and settlement pattern could be used in relation to neighbouring zones to elucidate the history of Tendring District	2

5.7.2 Little Clacton HECZ 6.5

141. Only a relatively small proportion of this character zone falls within the cable landfall search area. The wider zone extends north to Weeley Heath and east to the environs of St Osyth.

142. Little Clacton comprises a gently undulating agricultural landscape, open in aspect. Most of the character area extends beyond the cable landfall search area to the west beyond Little Clacton. The fieldscape comprises a mixture of rectilinear fields of ancient origin and former heathlands enclosed in the 19th century, though most of the heathland is outside the western extend of the cable landfall search area. There has been some post-1950s boundary loss. The settlement pattern of the zone was historically highly dispersed, comprising a church/hall complex at Little Clacton, a scattering of cottages around the greens and at road junctions and a number of isolated halls and farms. Modern roadside development has taken place all along the road between Little Clacton and Great Clacton and the heaths have also been largely infilled with housing.

143. The river terrace gravels in the south-eastern corner of this zone derive from a former line of the River Medway, and have the potential to contain Palaeolithic deposits. There are numerous groups of cropmarks, including within the cable landfall search area, which have the potential to comprise prehistoric (Bronze Age and Iron Age) and potentially even Roman settlement evidence as well as historic field boundaries of Medieval or Post Medieval date. Cropmarks of moated sites have been identified outside the cable landfall search area. There is a likelihood of Medieval deposits related to the historically dispersed settlement pattern surviving in this zone. Excavations in advance of the construction of the A133 (over 2km to the west) have confirmed the presence of below-ground archaeological remains dating from the prehistoric period onwards.

Table 5.6 Little Clacton HECZ 6.5

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Range of multi-period cropmarks, historic settlement pattern, ancient woodland	2
Survival	Good survival of below ground remains, historic settlement pattern	2
Documentation	HER data, cartographic, NMP, excavation reports	2
Group Value Association	Cropmarks, settlement patterns and historic landscape features	2
Potential	Good potential for below ground archaeological deposits	3
Sensitivity to change	Sensitive to change due to the significance and nature of the historic settlement pattern	3
Amenity Value	Cropmarks and settlement pattern could be used in relation to neighbouring zones to elucidate the history of Tendring District	2

5.7.3 Holland Brook Floodplain HECZ 6.6

144. Approximately half of this character zone falls within the cable landfall search area. The floodplain zone extends further north up to Thorpe-le-Soken, following the line of the former Gunfleet estuary.

145. Holland Brook Floodplain comprises the lower reaches of the Holland Brook and its floodplain. The fieldscape is defined by a mix of grazing marsh and enclosed meadow pasture, laid out in rectilinear fields bordered by straight drainage ditches. The river is bordered by willows and other streamside vegetation. The grasslands are still grazed. They are protected as a SSSI. The historic crossing points across the river are marked by stone bridges, at Fan Bridge, Holland Bridge and Rice Bridge (at Thorpe-le-Soken). There are no buildings in this zone.

146. The alluvial silts in river valley of the Holland River have the potential to hold important paleoenvironmental evidence relating to vegetation, climatic and coastal changes in the history of Tendring peninsula. Although there are at present no historic structures, with the exception of the bridges, within this zone, it is possible that the river was exploited as a source of water and water-power in the past and structural remains may survive below-ground.

Table 5.7 Holland Brook Floodplain HECZ 6.6

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Possible Palaeo-environmental deposits, meadow pasture	2
Survival	Historic field pattern survives well, below ground deposits including Palaeo-environmental remains are likely to be well preserved	3
Documentation	Cartographic	1
Group Value Association	Meadow pasture features	2
Potential	High potential for palaeo-environmental deposits	3

SCORING CRITERIA	DESCRIPTION	SCORE
Sensitivity to change	Field pattern and palaeo-environmental deposits highly sensitive	3
Amenity Value	Historic nature of meadow pasture could be used in relation to neighbouring zones to elucidate the history of Tendring District	2

5.7.4 Holland Haven HECZ 6.7

147. The majority of this character zone falls within the coastal fringe of the cable landfall search area.

148. Holland Haven comprises an area of drained coastal marshland located between Clacton and Frinton. Originating as salt-marsh it was enclosed and drained in the 17th century to form coastal grazing marsh. Elements of the original creeks still survive within the landscape, coupled with straight drainage ditches. Part of the zone is still being grazed, whilst the remainder has been converted to a golf course. The marshes are protected as a SSSI. There are no buildings in this zone with the exception of the golf course buildings.

149. The alluvial silts in this zone have the potential to hold important paleoenvironmental evidence for vegetation, climatic and coastal changes relating to the history of the Tendring peninsula. The known archaeology relates to its coastal position. One Red Hill (Late Iron Age or Roman salt-making site) is recorded and more may be present. Later periods are represented by defensive structures, including an early 20th century gun emplacement at Chevaux de Frise Point and a World War II Heavy Anti Aircraft site at Little Holland. Two lines of sea-wall are visible, with the innermost probably representing the 17th century reclamation line.

Table 5.8 Holland Haven HECZ 6.7

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Red hills, original grazing marsh, military sites	2
Survival	Good survival of both landscape and archaeological deposits	3
Documentation	HER data, cartographic	2
Group Value Association	Features relating to coastal/wetland exploitation, Second World War defences	3
Potential	Good potential for below ground archaeological and palaeo-environmental deposits	3
Sensitivity to change	Below ground deposits, surviving historic landscape features and remaining military sites highly sensitive to change	3
Amenity Value	Potential for promotion of historic coastal/wetland exploitation and military defences in association with other coastal zones	2

5.8 APS Assessment of Aerial Imagery

150. Below is a summary of APS report *North Falls Offshore Wind farm Onshore Scoping Components, Scoping Report: Assessment of Aerial Imagery for Archaeology* (July 2021) included in Annex D, Figures 1-14. The object of

this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised ALS, which is also known as LiDAR, to assess the topographic and micro topographic features within the cable landfall search area (referred to as "the Site" throughout the report), alongside historic map regression analysis.

151. Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates. Features dating to the prehistoric, Medieval, Post Medieval and Modern periods have been identified and mapped. Some of these features have been previously identified by the EHER and ENMP survey.

152. In some cases this assessment has augmented and added to these data e.g. from modern airborne and satellite imagery sources.

153. It is obvious that the below-ground archaeological deposits which cause the marks in crops and grass in this area are more extensive, both horizontally and vertically, than shown via the aerial imagery. Absence of cropmark evidence does not necessarily indicate an absence of archaeological deposits in apparently blank areas. The cable landfall search area also contains extensive natural periglacial features which will further mask overlying archaeological deposits.

154. The assessment identified 19 areas of archaeological interest (APS Sites) within the cable landfall search area which are detailed below (Figure 7). The table also aligns the APS Sites with the NFID numbers assigned as part of this desk-based assessment.

Table 5.9 Heritage Assets identified through aerial imagery

NFID	APS SITE	ASSET TYPE	CONDITION ON LAST RECORDED DATA SOURCE	PERIOD	EHER MONUID
214	**APS_01**	Pits, possibly minefield	Levelled, grassmark	World War II	MEX49906
219 **218**	**APS_02**	Field system	Levelled, cropmark	Post Medieval	MEX10602 MEX103137 1
212	**APS_03**	Anti-Aircraft defence site	Former structure, now levelled, crop and grassmark	World War II	MEX103135 8
-	**APS_04**	Field system	Levelled, cropmark	Post Medieval	
217 **218**	**APS_05**	Field System, settlement features (enclosures) and ring ditches	Levelled, cropmark	Prehistoric – Post Medieval	MEX10628 MEX10313 71
217	**APS_06**	Round barrow	Levelled, cropmark	Prehistoric	MEX10628
217	**APS_07**	Pit	Levelled, cropmark	Unknown, possible	MEX10628

NFID	APS SITE	ASSET TYPE	CONDITION ON LAST RECORDED DATA SOURCE	PERIOD	EHER MONUID
				prehistoric (Bronze Age)	
191	**APS_08**	Square Enclosure	Levelled, cropmark	Medieval	MEX1031368
193	**APS_09**	Field System, trackway, boundaries	Levelled, cropmark	Prehistoric / unknown overlain by Post Medieval fields	MEX10655 MEX10609
190	**APS_10**	Field System, track	Levelled, cropmark	Post Medieval / Modern	MEX1031361
215 **191**	**APS_11**	Field System	Levelled, cropmark	Post Medieval	MEX10636 MEX1031368
215	**APS_12**	Round barrow	Levelled, cropmark	Prehistoric	MEX10636
215	**APS_13**	Ring ditch, likely round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10636
192	**APS_14**	Field system, square enclosure	Levelled, cropmark	Post Medieval	MEX13203
	APS_15	Field system	Residual earthwork via LiDAR data	Post Medieval	
178	**APS_16**	Ditches, possible buried settlement	Levelled, cropmark	Medieval / Modern	MEX10618
	APS_17	Round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10618
	APS_18	Field system	Residual earthwork via LiDAR data	Medieval / Modern	MEX10618
	APS_19	Ring ditch	Levelled, cropmark	Possible prehistoric (Bronze Age)	

155. A detailed analysis of these sites is given in Section 5 of the APS report.

5.9 Setting Assessment Baseline

156. An initial heritage settings (baseline) characterisation has been undertaken with respect identifying assets which could potentially be impacted by any proposed (predominantly above ground) infrastructure sited within the cable landfall search area. The heritage settings (baseline) assessment has identified the

designated heritage assets (e.g. Scheduled Monuments, Registered Parks and Gardens, Listed Buildings and Conservation Areas) located within a 5km study area on all sides around the cable landfall search area (Annex B).

157. Those assets with a setting that potentially contributes in a material way to their heritage significance include assets of a certain height or predominance within the landscape, such as churches.

158. Formal Landscape and Visual Impact Assessment (LVIA) processes, and associated tool kits, such as Zones of Theoretical Visibility (ZTVs) and photomontages have not yet been produced. However, key LVIA and Heritage viewpoints will be identified for comment by relevant stakeholders at the appropriate juncture. These viewpoints will take account of and specifically reflect the topography of the landscape within and through which the project infrastructure will be constructed and operated within this area.

159. Any potential impacts to heritage significance associated with a change in setting of identified heritage assets from both construction, but predominantly operational activities, will be further addressed in the PEIR and the detailed findings reported in the subsequent final ES.

160. As yet no walkover surveys/heritage specific site visits have been undertaken.

161. The key areas where setting impacts may occur are most likely to be limited to designated assets within the cable landfall search area and those within 1-2km of proposed infrastructure, namely Conservation Areas and Listed Buildings at Great Holland and Frinton. However, without definitive information on the exact nature and location of infrastructure at this stage it is not possible to reliably identify any areas where potential effects may occur.

6 Discussion

6.1 Summary of archaeological potential

162. The archaeological evidence in the cable landfall search area reflects a human presence from the prehistoric to the present day.

163. There is potential for paleoenvironmental deposits containing data relating to the past environment, such as vegetation, climate and coastal changes. The river terrace gravels in the Little Clacton area and the alluvial deposits in the Holland Haven and Holland floodplain areas may contain deposits that would provide a greater understanding of the Tendring peninsula.

164. Finds from the prehistoric period suggest that the cable landfall search area provided an environment suitable for exploitation during the Palaeolithic and Mesolithic periods. The wider archaeological record suggests a prevalence of activities associated with subsistence, reflective of a nomadic existence of a hunter-gatherer lifestyle. Should further remains from this early period exist within the cable landfall search area, they will most likely comprise artefactual lithic finds.

165. Whilst the archaeological record is limited to lithic finds for the Neolithic period within the cable landfall search area, evidence in the wider area comprises a more settled existence from this period onwards. Evidence for Neolithic

settlement has also been found as a result of coastal erosion at Clacton. Should further remains from this period exist within the cable landfall search area, they will most likely comprise artefactual lithic finds, with a possibility of settlement evidence.

166. The archaeological record well attests to Bronze Age funerary activity in the wider area. Cropmark evidence and finds within the cable landfall search area suggest there is potential for previously unrecorded assets dating to the Bronze Age relating to funerary practice in particular.

167. Evidence for Iron Age activity in the wider area is attested by dispersed domestic and agricultural settlements, field systems, cremation burials and red hills (salt production). The evidence within the cable landfall search area is relatively limited, which does not preclude potential previously unrecorded assets dating to the Iron Age and may be more reflective of the lack of archaeological investigations in the cable landfall search area.

168. There is no substantial evidence for Romano-British activity in the cable landfall search area, however, it is well attested across the wider Tendring Penninsula. Any previously unrecorded assets would likely be representative of land-use in association with settlement and subsistence.

169. Whilst the archaeological record is relatively sparse for the Early Medieval / Saxon period in the wider area, and very limited within the cable landfall search area this may be more reflective of either a reoccupation or continued occupation of settlements following on from the Roman period. Any previously unrecorded assets would likely be representative of land-use in association with settlement and subsistence.

170. Within the cable landfall search area previously unrecorded assets from the Medieval period are likely to relate to the gradual reclamation of the marsh land and general exploitation of this landscape for commercial, agricultural and industrial purposes. Assets relating to settlement evidence for the Medieval period would potentially be concentrated in the vicinity of existing settlements and farmstead.

171. Within the cable landfall search area previously unrecorded assets from the Post Medieval period are similarly likely to relate to the reclamation of the marsh land and the formation of the landscape into its present state. Assets relating to settlement, commerce, agriculture and industry are likely to be present. Despite the significant growth and urbanisation of the surrounding villages and towns in this period, the cable landfall search area has remained largely rural and agricultural in nature.

172. Currently unknown archaeological remains dating from the 19th century onwards in the cable landfall search area are likely to be predominantly representative of defence measures (e.g. Martello Tower, pillboxes, anti-aircraft infrastructure and minefields) or may provide direct evidence of hostilities (e.g. bomb craters and defence).

173. The cable landfall search area was reviewed and assessed in detail as part of the aerial photographic and LiDAR data assessment, and found to contain a high potential for the further discovery of buried archaeological sites/features. The assessment confirmed and revealed a series of cropmark sites, with

particular concentrations in the vicinity of Cooks Green and Great Holland, indicative of a complex multi-period buried archaeological landscape dating from earlier prehistoric through to modern periods (APS, 2021, Annex D). These cropmark features were more abundant in the northern reaches of the cable landfall search area, due to being much drier than the marshland surrounding the Holland Brook and former tidal estuary. By comparison, cropmark features are less plentiful in the southern reaches and the vicinity of the marshlands and Holland Brook, however this does not preclude the potential for buried archaeological remains to survive, in fact the wet environment is much more favourable for the preservation of natural materials such as timber, fabric and leather etc.

7 Recommendations for further assessment

7.1 Areas of archaeological sensitivity

174. It has been possible to define several Areas of Archaeological Sensitivity (Figure 8) which have been defined by the results of the APS assessment. These areas of particular archaeological sensitivity are broadly defined by locations where the archaeological resource may include buried remains of prehistoric settlement, agricultural and funerary activity (barrows/ring ditches). A 10m buffer has been applied around the margin of such features when defining the Areas of Archaeological Sensitivity. It is suggested that these areas are avoided if possible or, where avoidance is not possible, further assessment including priority geophysical survey and/or walkover survey are undertaken to better qualify the present understanding of archaeological sensitivity and potential.

175. It should be noted that there are limitations to the degree of certainty and reliability that can be applied to features identified through cropmark and soilmark evidence. Further assessment is required by means of survey work, such as geophysical survey and walkover survey, to more accurately define the potential date, extent and survival of these features.

7.2 Priority geophysical survey

176. Priority geophysical survey is recommended at the location of the landfall (where cables come ashore, and above ground infrastructure is located) in order to gain a better understanding of the archaeological potential in this area.

177. The potential for buried remains to be present is considered to be high. A targeted selection of the more substantial looking cropmark features should be included in a subsequent programme of (pre-application) priority geophysical survey to be discussed and agreed in consultation with Tendring District Council, Essex County Council and Historic England, at an early stage. The aerial photographic and LiDAR assessment revealed the higher ground above the marshes within the cable landfall search area has been subject to heavy agricultural use for several decades, leaving the area heavily plough eroded. Despite this, there is potential for buried archaeological features or assets to survive. Any such features would expect to be revealed upon the stripping of topsoil and subsoil, unless they are extremely eroded.

178. Further optioneering and site selection work will enable a more targeted definition of areas where geophysical survey will be carried out. At present the location of landfall, above ground infrastructure and cable routes have not been clearly defined.

179. The results of priority geophysical survey may also help to better define any areas where avoidance of buried archaeology may be advisable.

7.3 Walkover survey

180. A walkover survey will be necessary to ground truth identified heritage assets and potential areas of archaeological sensitivity. A walkover survey will also be carried out as part of the settings assessment, which will be included in the PEIR and ES chapters. A walkover survey will be undertaken once the onshore project area has been further defined and will form either an Addendum to this report or a separate accompanying report.

7.4 Trial trenching

181. Areas of targeted trial trenching will be discussed and agreed in consultation with Essex County Council, Tendring District County Council and Historic England once a program of priority geophysical survey has been undertaken. The results of the priority geophysical survey will be used to identify targeted areas for further assessment by means of archaeological evaluation.

7.5 Geoarchaeological assessment

182. A Geoarchaeological DBA should be carried out by a specialist geoarchaeological contractor to gain a better understanding of areas where further assessment would be required. There is known potential for paleoenvironmental evidence within the cable landfall search area within the former extent of the Gunfleet estuary and its environs. It is anticipated that early ground/site investigation works will also be able to support this process and identify key areas of paleoenvironmental potential. It is also anticipated that, where necessary and possible, priority geophysical survey would ideally include resistivity survey in the former channel of the Gunfleet estuary. Following the result of the geoarchaeological DBA, further consultation and discussion with Essex County Council, Tendring District County Council and Historic England will be undertaken to define the scope of further assessment and investigation.

8 Potential Project Impacts

183. A fuller impact assessment will be provided in the PEIR and subsequent ES Chapters, however initial assessment of potential impacts is presented below, to form a preliminary indication to inform and guide the impact assessment.

184. Any development of infrastructure within the cable landfall search area has the potential to impact upon the historic environment in a number of ways, either directly (physical) or indirectly (non-physical). Some of these impacts could be temporary, such as those during construction, or be more permanent, lasting for the lifespan of the project. Direct (physical) impacts could occur where

heritage assets are partially or completely damaged or removed by construction works, whilst indirect (non-physical) impacts would relate to any changes in setting that occur to heritage assets due to the introduction of infrastructure into the landscape, and particularly in respect to above ground structures, such as substations.

8.1 Potential impacts during construction

185. Construction activities which could affect the onshore archaeology and cultural heritage resource are: any intrusive groundworks, including directional drilling, piling (if required), and open cut trench excavation; construction of any temporary work areas or permanent above ground infrastructure; general construction activities such as plant movement or increased traffic movements due to construction.

186. The potential impacts during construction that will be assessed are:

- Direct, physical impacts to designated heritage assets;
- Direct, physical impacts to non-designated heritage assets;
- Indirect, physical impacts to designated heritage assets;
- Indirect, physical impacts to non-designated heritage assets;
- Temporary change to the setting of designated heritage asset, which could affect their heritage significance (during construction); and
- Temporary change to the setting of non-designated heritage assets, which could affect their heritage significance (during construction).

8.2 Potential impacts during operation

187. As the majority of the project infrastructure is buried sub-surface (i.e. infrastructure associated with the buried cable systems and installation of foundations), this element of the operational project will have limited potential to further impact the archaeology and cultural heritage resource.

188. Activity which could have an ongoing impact to the onshore archaeology and cultural heritage resource will be the presence of the onshore substation and the potential visibility of the offshore infrastructure from coastal heritage assets. Any permanent above ground infrastructure has the potential to result in a change to the setting of heritage assets, which could affect heritage significance. The main potential impacts during operation are:

- Permanent change to the setting of designated heritage assets, which could affect their heritage significance; and
- Permanent change to the setting of non-designated heritage assets, which could affect their heritage significance.

189. There would also be potential for impacts to the setting of heritage assets from the presence of the installed infrastructure and ongoing maintenance activities.

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Annex A. Figures

618000 619000 620000 621000 622000 623000

220000 219000 218000 217000 216000

Great Holland
Holland-on-Sea
Bursville Park
Holland Haven
Holland Gap
Sandy Point
Frinton Golf Course
Holland Haven Country Park
Holland Bridge
Great Holland Pits Nature Reserve
Great Holland Mill (Provender)
Great Holland Hall
Great Holland Lodge
Holland Mill Wood
Holland Wood
Hollandhall Wood
Prospect Park
Park Fruit Farm
Mayfields Farm
Birch Hoe Farm
Brickkiln Grove
Green End Farm
Larges Farm
The Old Rectory
Manor Farm
Dairy House Farm
Vesey Farm
Hunter's Bridge (FB)
Little Clacton Lodge
Parkgate Farm
Parkgate Corner
Cook's Green
Coolsgreen Farm
Bond's Farm
Oak House Farm
Willow Farm
Sladbury's Old House
Sladburies
Sladburys Cottages
Treasure Holt Farm
Pond House
Smythie's Farm
Bell's Farm
Fan Bridge
Lodge Farm
Sheep Wash
Pumping Station
Chevaux de frise Point Breakwater
Breakwater
Playing Field
Sportd Gd
Nurseries
Cemy
Schs
Sch
Liby
Lodge Road
Park Lane
Dead Lane (Path)
Holland Brook
Picker's Ditch
The Crescent
The Greensward
Groynes
B1032
B1027

Legend

Cable Landfall Search Area

0 0.25 0.5 1 km

Drawing Title

Cable Landfall Search Area Location Plan

Rev	Date	Remarks	Drwn	Chkd
01	26/07/2021	First issue	FC	FB

Drawing Number	Figure Number
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Scale	Plot Size	Datum	Projection
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Offshore Wind Farm

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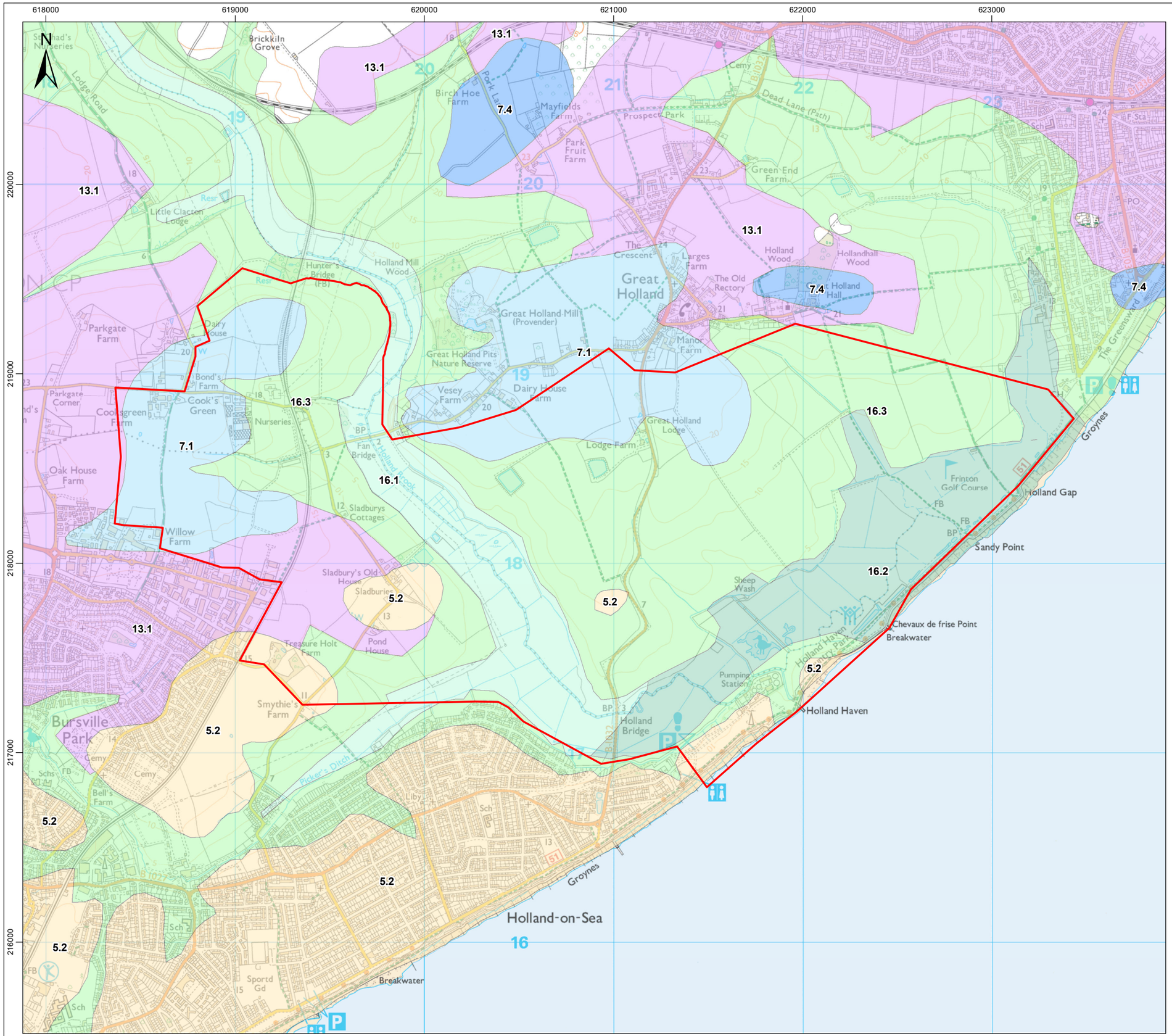

Legend

- Cable Landfall Search Area

Geodiversity Characterisation Zones (GCZ)

- 5.2
- 7.1
- 7.4
- 13.1
- 16.1
- 16.2
- 16.3

0 0.25 0.5 1 km

Drawing Title

Tendring Geodiversity Characterisation

Rev	Date	Remarks	Drwn	Chkd
01	26/07/2021	First issue	FC	FB

Drawing Number	Figure Number
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Scale	Plot Size	Datum	Projection
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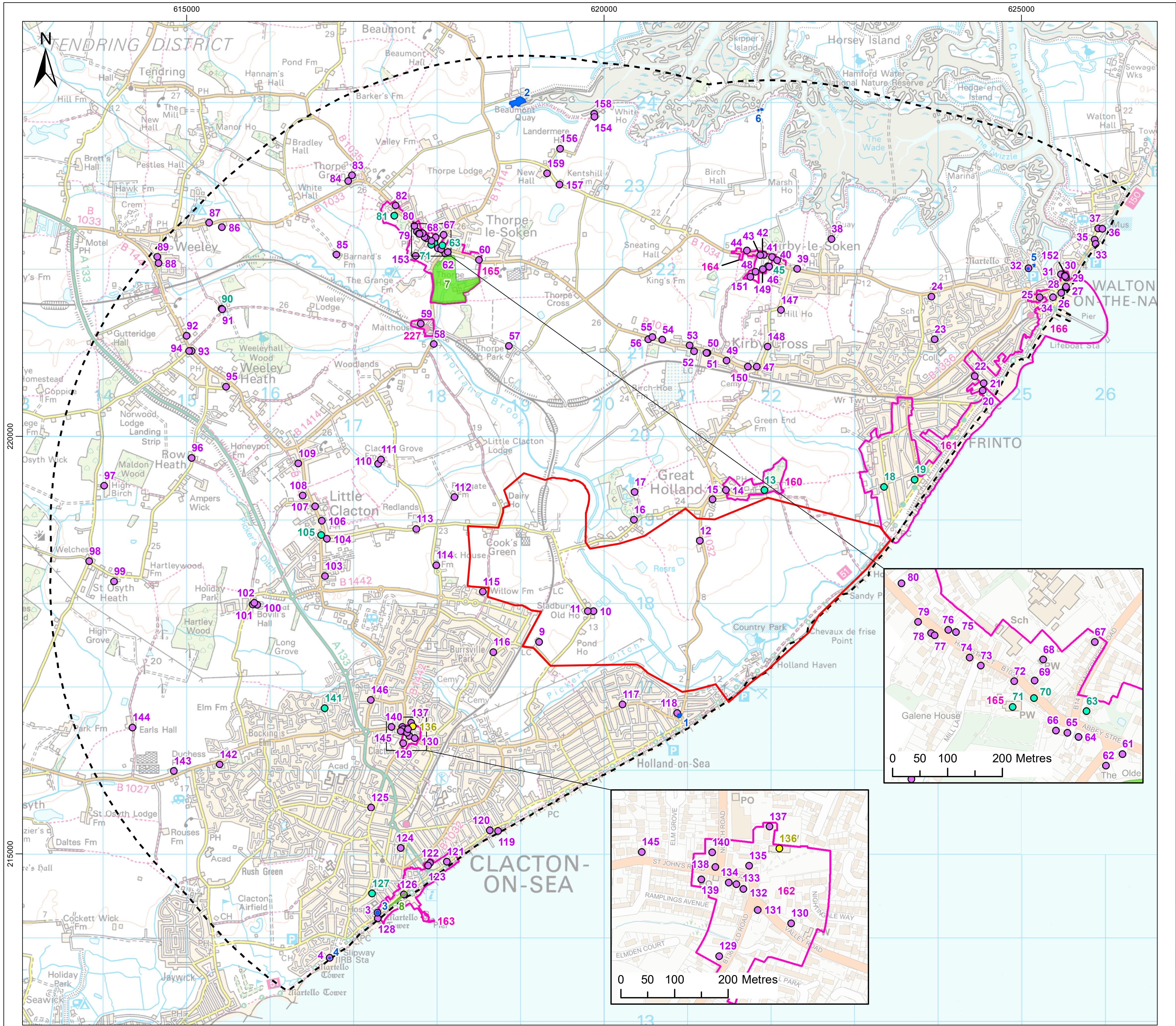

Legend

- Cable Landfall Search Area
- Cable Landfall Search Area 5km Buffer
- Scheduled Monument
- Registered Park and Garden
- Conservation Area

Listed Building Grades

- I
- II*
- II

0 0.5 1 2 km

Data Source: © Historic England, 2021. © HaskoningDHV UK Ltd. 2021.
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Drawing Title

Designated Heritage Assets within 5km of the Cable Landfall Search Area

Rev	Date	Remarks	Drwn	Chkd
01	26/07/2021	First issue	FC	FB

Drawing Number	Figure Number
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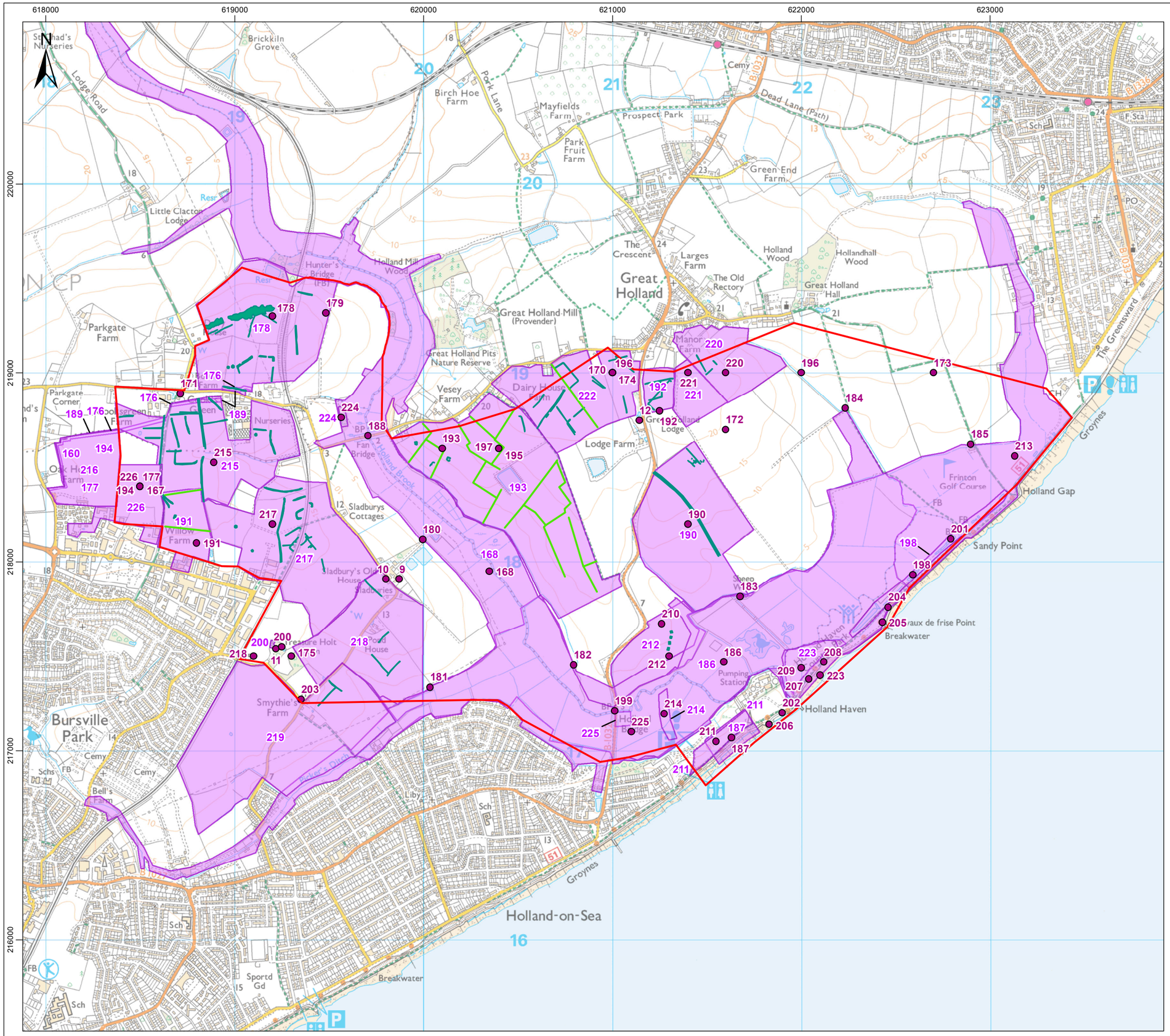

Legend

- Cable Landfall Search Area

Non-Designated Heritage Assets

- Monument Point
- Monument Polygon
- NMP Polyline
- NMP Polygon

0 0.25 0.5 1 km

Drawing Title

Non-Designated Heritage Assets within the Cable Landfall Search Area

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01	26/07/2021	First issue	FC	FB

Drawing Number	Figure Number
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Scale	Plot Size	Datum	Projection
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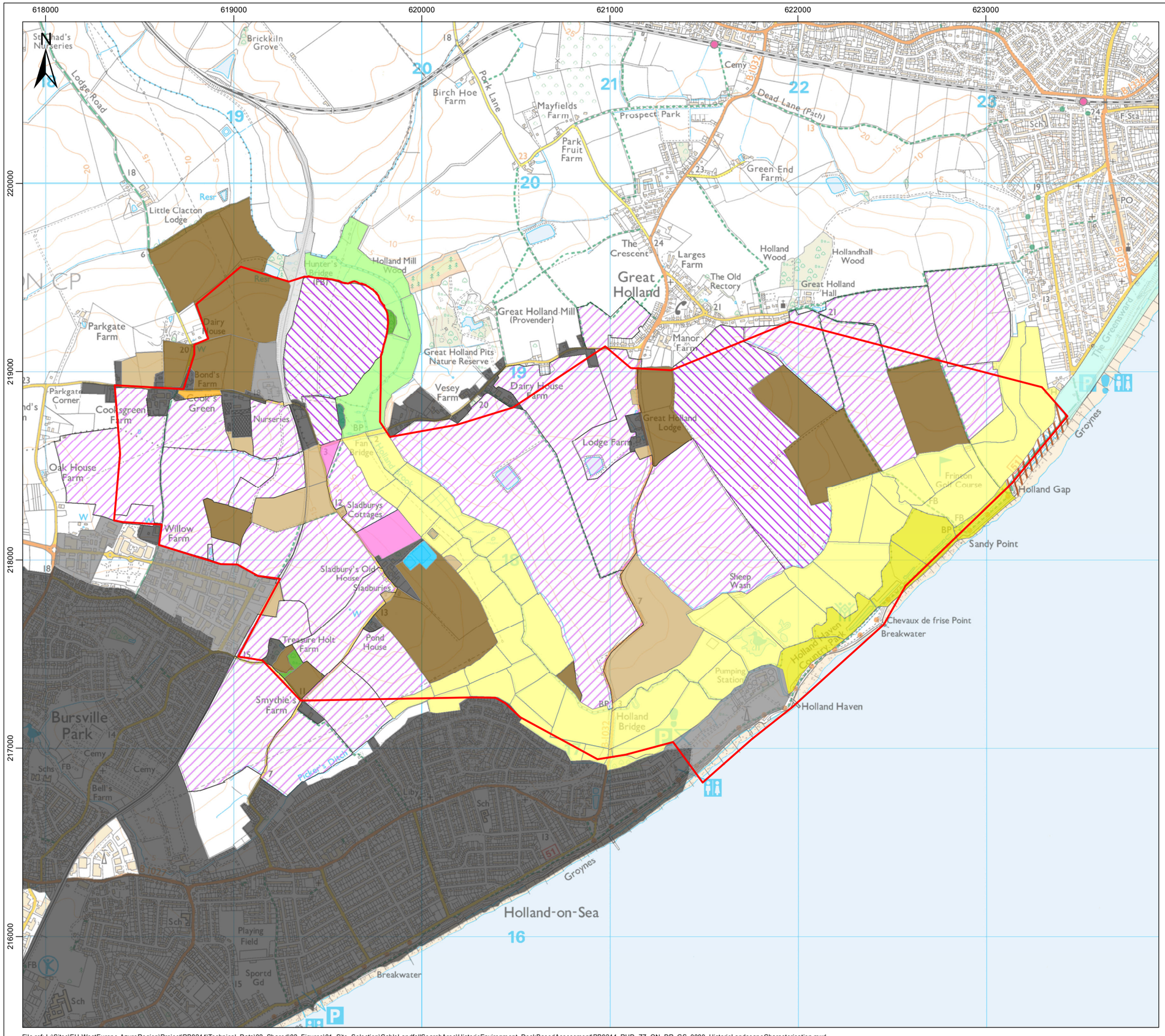

Legend

- Cable Landfall Search Area

Historic Landscape Characterisation Type

- "20thC" Enclosure
- 18th-20th Century Woodland Plantation
- Ancient Woodland
- Boundary Loss
- Boundary Loss - with Relict Elements
- Built-Up Areas - Urban Development
- Commons with an Open Margin
- Drained Reclamation - Curvilinear - Pre-18thC
- Drained Reclamation - Rectilinear - 19thC/20thC
- Enclosed Meadow
- Industrial
- Irregular Enclosure
- Leisure/Recreation
- Motorway, Railway
- Piecemeal Enclosure by Agreement
- Sea Defences
- Unimproved Intertidal
- Water Reservoir

0 0.25 0.5 1 km

Drawing Title

Historic Landscape Characterisation

Rev	Date	Remarks	Drwn	Chkd
01	26/07/2021	First issue	FC	FB

Drawing Number	Figure Number
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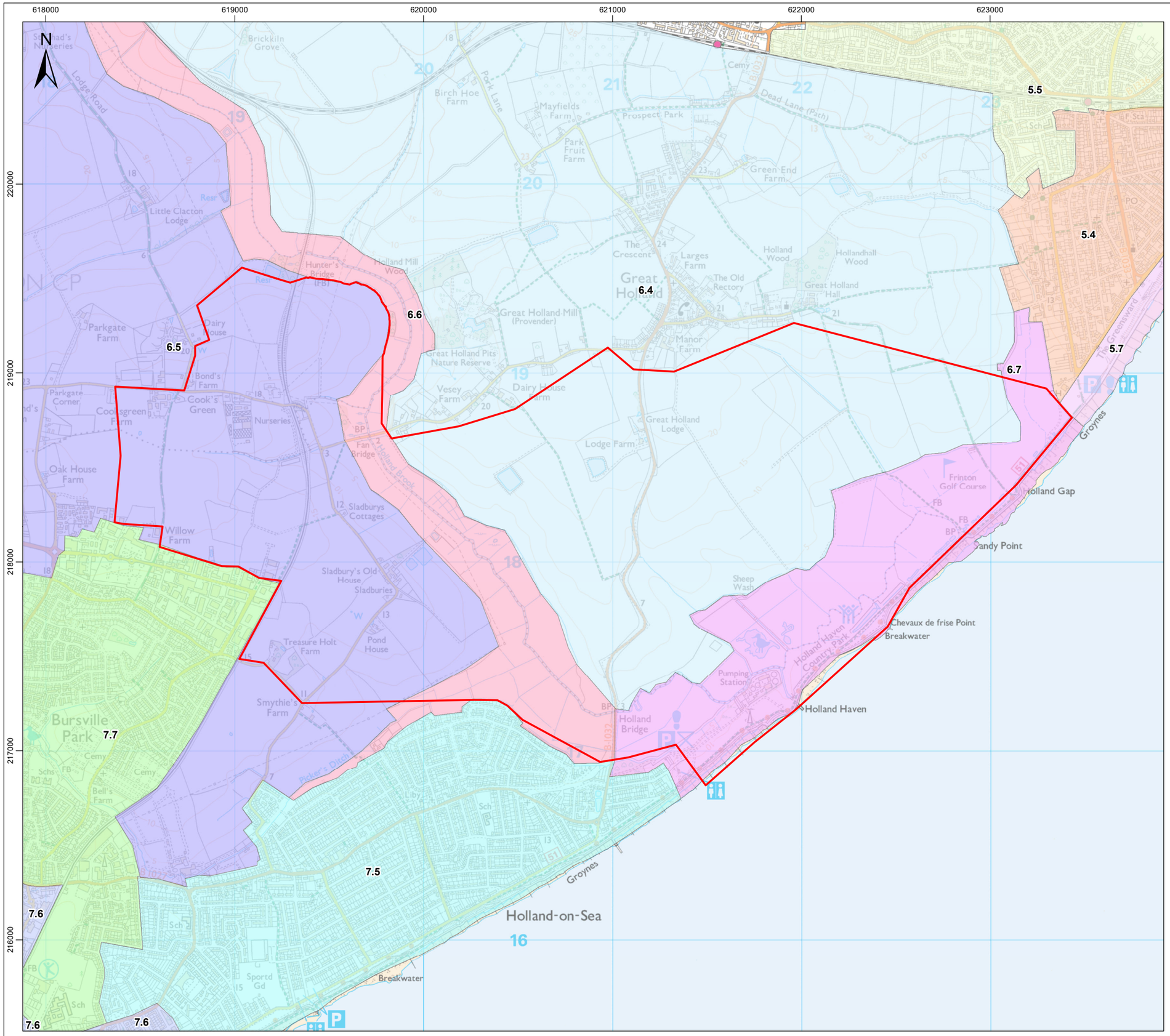

Legend

- Cable Landfall Search Area

Historic Environment Characterisation (HECZ)

- 5.4
- 5.5
- 5.7
- 6.4
- 6.5
- 6.6
- 6.7
- 7.5
- 7.6
- 7.7

0 0.25 0.5 1 km

Drawing Title

Tendring Historic Environment Characterisation

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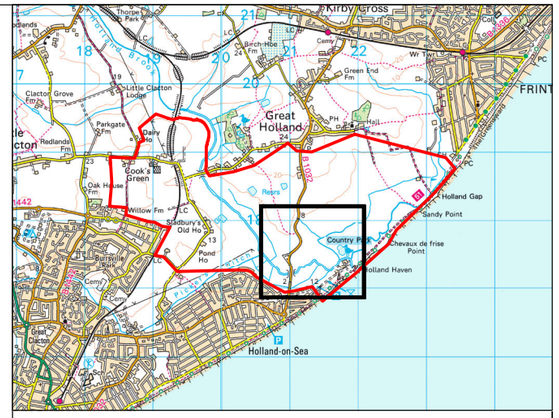
7m
6m
3m
1m
11m
Track
Livestock Pen
Drain
FB
Sluice
Holland Haven
Sewage Works
Sluice Gate Cottages
Outfall
Hard
Mast
Groynes
Sand
Path
Car Park
PC
MANOR WAY
FRINTON ROAD
B1032
FLEETWOOD AVENUE



Legend

- Cable Landfall Search Area
- Site Polygons

Heritage Assets

- Anti Aircraft Defence Site
- Boundary
- Building
- Defence Obstruction
- Road
- Structure
- NMP Mapping

0 50 100 200 Metres

Drawing Title

Heritage Assets Derived From Aerial Imagery (APS)

Rev	Date	Remarks	Drwn	Chkd
01	02/08/2021	First issue	FC	FB

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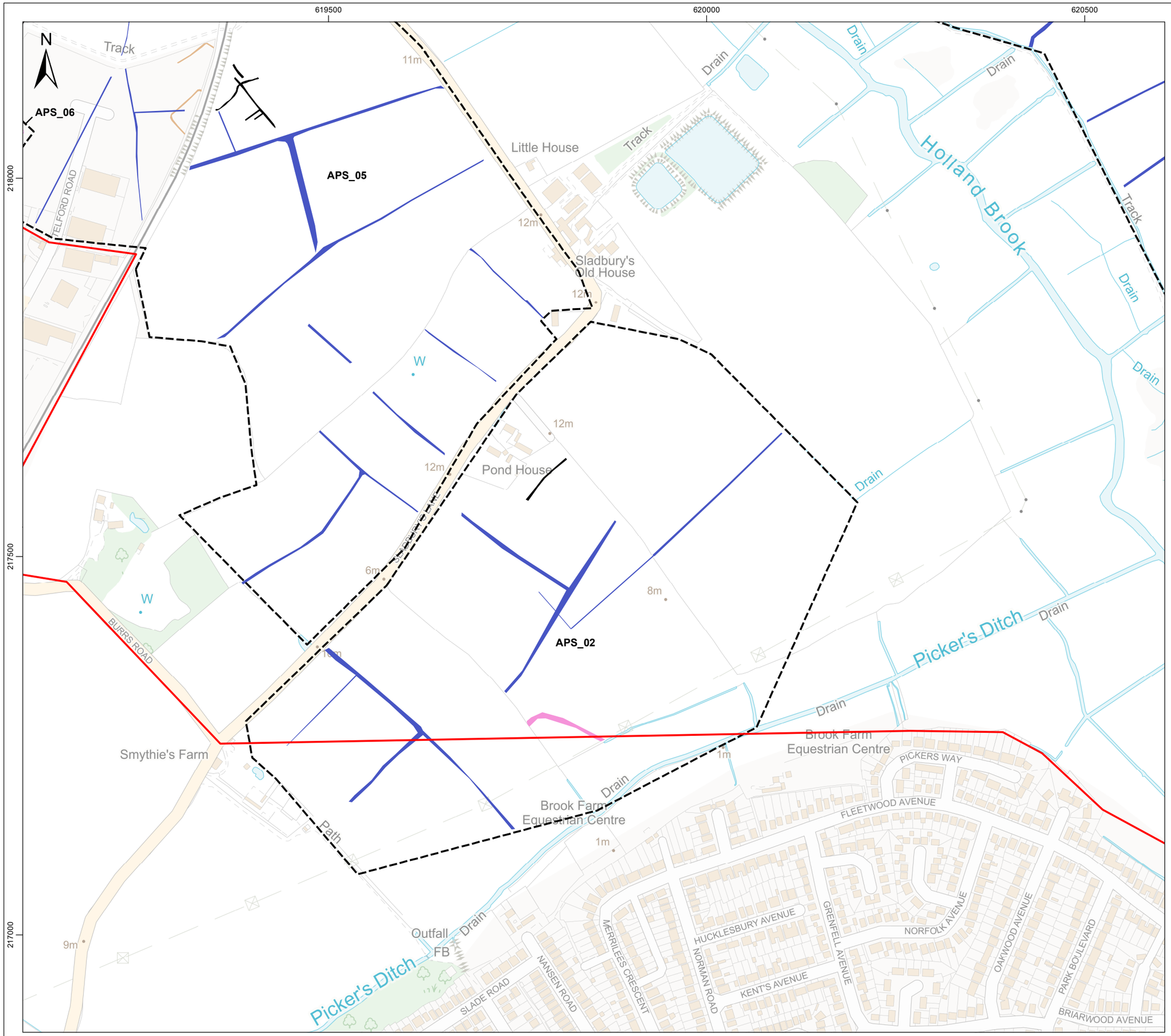

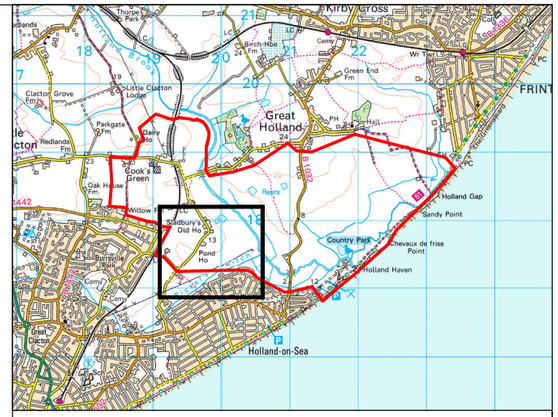

Legend

- Cable Landfall Search Area
- Site Polygons

Heritage Assets

- Boundary
- Ditch
- Enclosure
- NMP Mapping

0 50 100 200 Metres

Drawing Title

Heritage Assets Derived From Aerial Imagery (APS)

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219000 218500 218000

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APS_16

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APS_06

APS_05

Bond's Farm

Abattoir

Cooks Green Bungalow

Cook's Green Farm

Al Fresco

Telstar Nurseries

Bridge Cottages

Lambourn House

Sladburys Cottages

Little House

Clacton Common

Gorse Lane Industrial Estate

LODGE ROAD

HOLLAND ROAD

WOOD LANE

GREAT HOLLAND COMMON ROAD

SLADBURYS LANE

STEPHENSON ROAD WEST

STEPHENSON ROAD

PAXTON ROAD

DAVY ROAD

TELFORD ROAD

BRUNEL ROAD

GORSE LANE

WADE ROAD

Track

Path

Drain

Holland

Iss

Ws

W

21m

15m

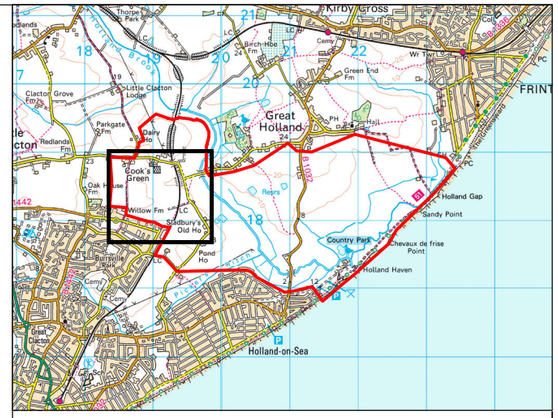
12m

11m

8m

3m

2m



Legend

- Cable Landfall Search Area
- Site Polygons

Heritage Assets

- Boundary
- Ditch
- Enclosure
- Pit
- Road
- NMP Mapping

0 50 100 200 Metres

Drawing Title

Heritage Assets Derived From Aerial Imagery (APS)

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620000
620500
621000
219000
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218000
N
1m
FB
nd Brook
MILL LANE
Track
The Willows
Yonder House
MAIN ROAD
White Lodge
LITTLE CLACTON ROAD
Tudor Cottage
Wind Turbine
Vesey Farm
Dairy House Farm
Track
20m
Focus Farm
APS_14
22m
Lodge Farm
17m
Drain
Hill House
Great Holland Lodge
Track
C
Drain
Track
Drain
Drain
Drain
Drain
Drain
Drain
Track
Holland Brook
Track
APS_09
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8m
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Track
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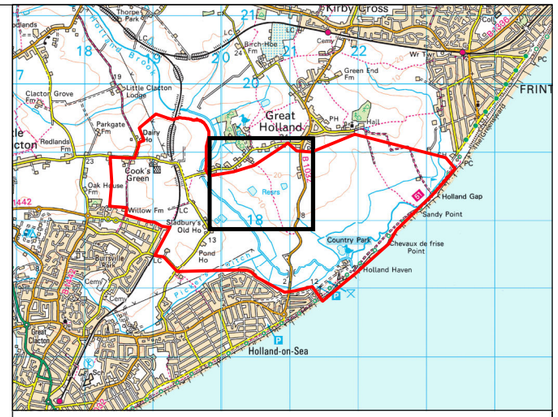

Legend

- Cable Landfall Search Area
- Site Polygons

Heritage Assets

- Boundary
- Ditch
- Enclosure
- Pit
- Road
- NMP Mapping

0 50 100 200 Metres

Drawing Title

Heritage Assets Derived From Aerial Imagery (APS)

Rev	Date	Remarks	Drwn	Chkd
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Drawing Number	Figure Number
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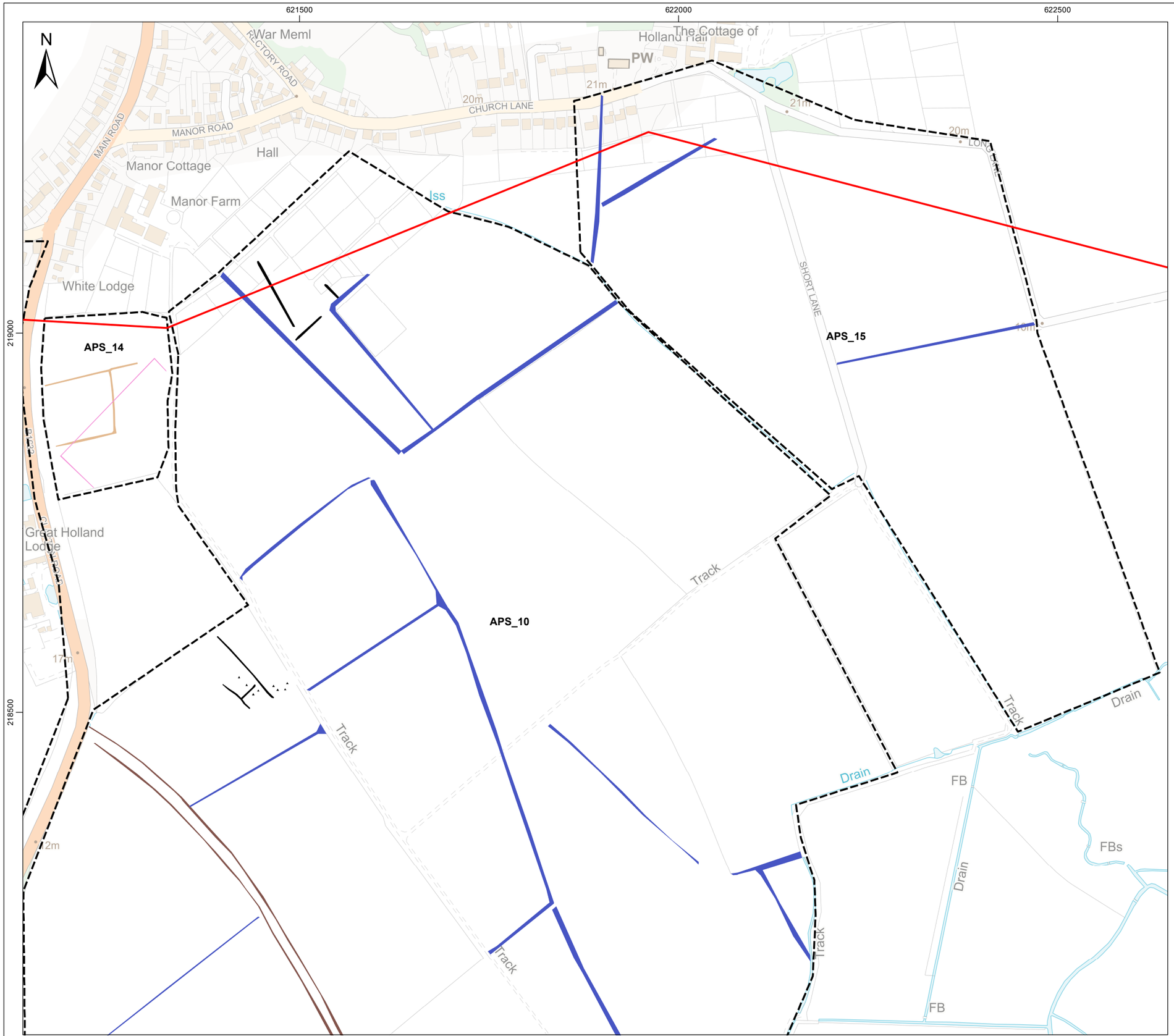

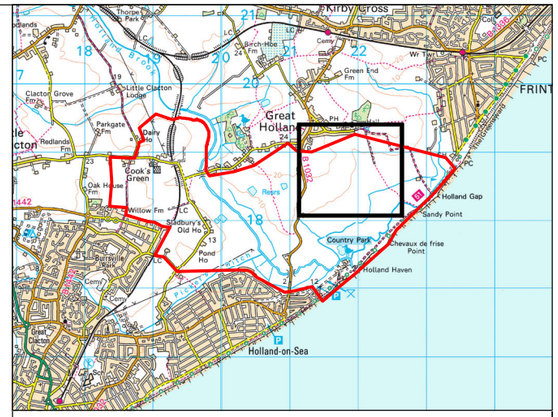

Legend

- Cable Landfall Search Area
- Site Polygons

Heritage Assets

- Boundary
- Ditch
- Enclosure
- Road
- NMP Mapping

0 50 100 200 Metres

Drawing Title

Heritage Assets Derived From Aerial Imagery (APS)

Rev	Date	Remarks	Drwn	Chkd
01	02/08/2021	First issue	FC	FB

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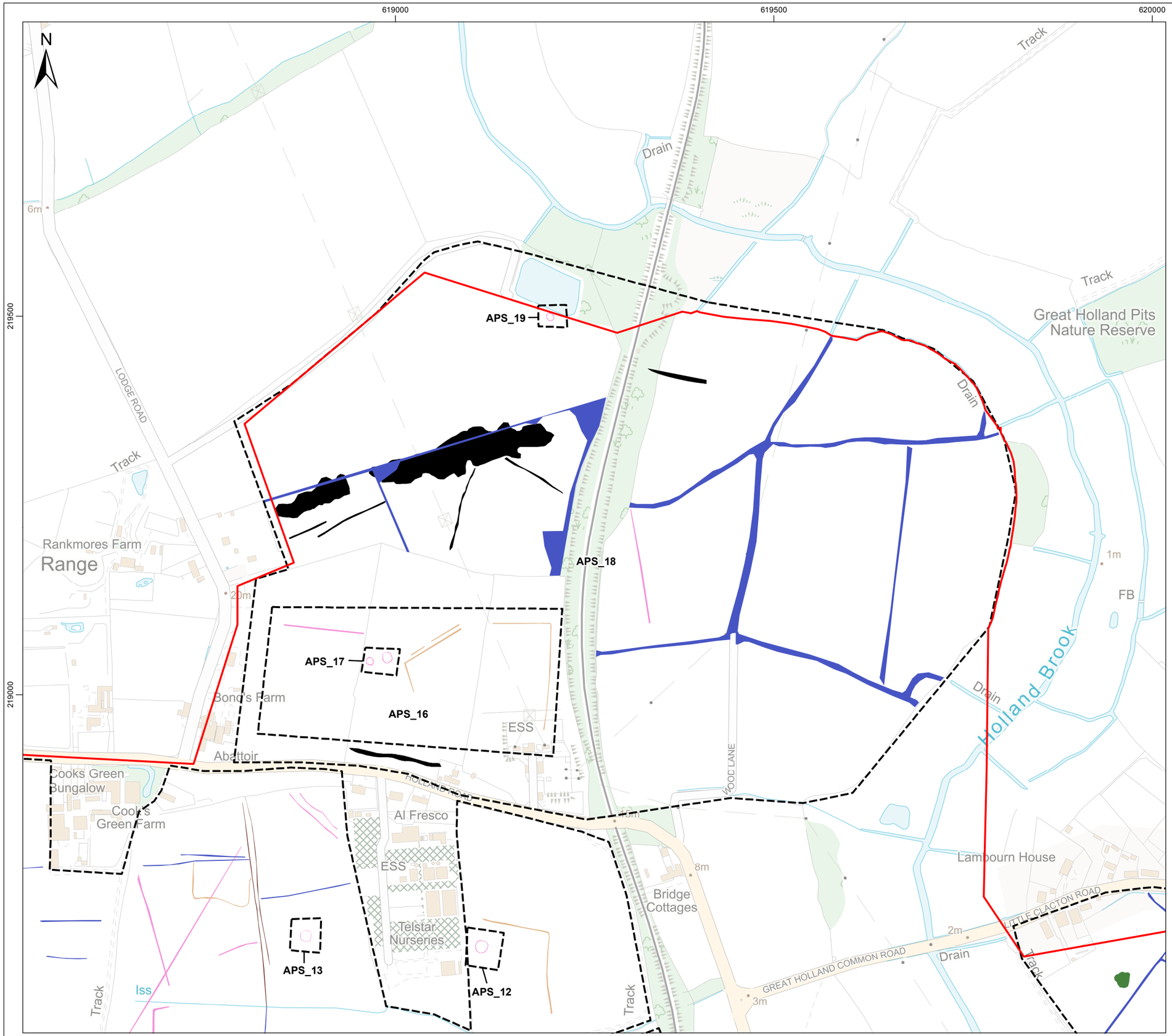

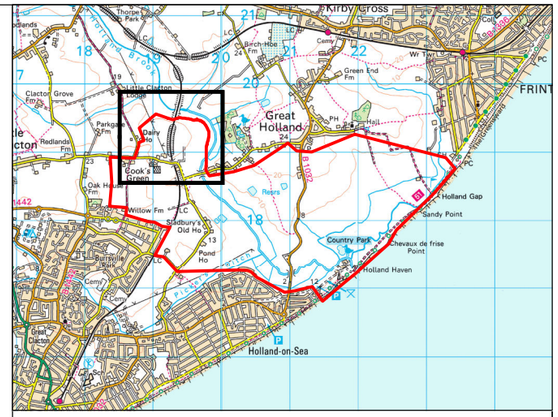

Legend

- Cable Landfall Search Area
- Site Polygons

Heritage Assets

- Boundary
- Ditch
- Enclosure
- Pit
- Road
- NMP Mapping

0 50 100 200 Metres

Drawing Title

Heritage Assets Derived From Aerial Imagery (APS)

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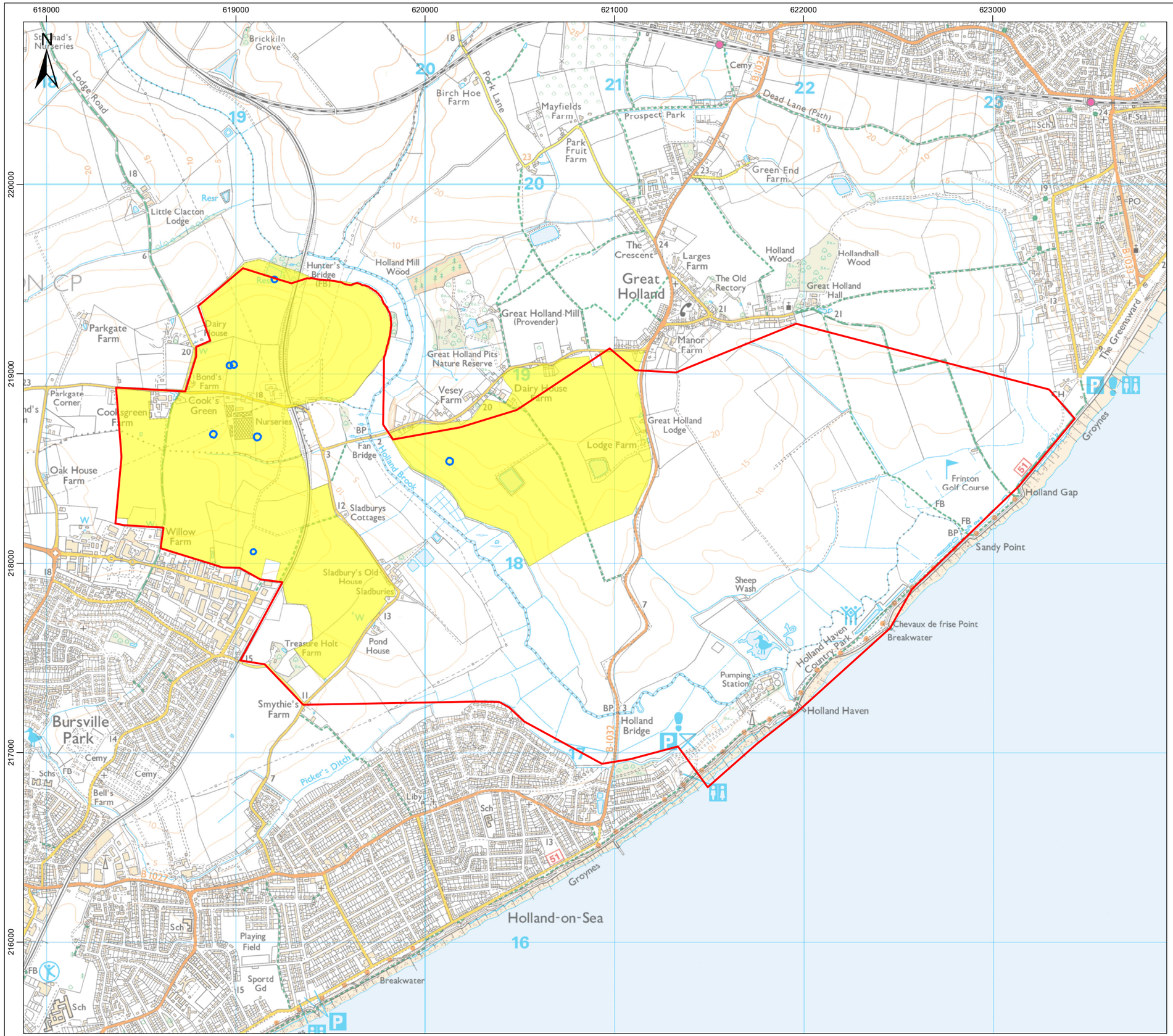

Legend

- Cable Landfall Search Area
- Potential Ring Ditch 10m Buffer
- Area of Archaeological Sensitivity

0 0.25 0.5 1 km

Drawing Title

Areas of Archaeological Sensitivity

Rev	Date	Remarks	Drwn	Chkd
01	02/08/2021	First issue	FC	FB

Drawing Number	Figure Number
PB9244-RHD-ZZ-ON-DR-GS-0083	8

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

Royal HaskoningDHV
Enhancing Society Together

NORTH FALLS
Offshore Wind Farm

File ref: L:\Sites\EU-WestEurope-AzureRegion\Project\PB9244\Technical_Data\02_Shared\02_Figures\01_Site_Selection\CableLandfallSearchArea\HistoricEnvironment_DeskBasedAssessment\PB9244_RHD_ZZ_ON_DR_GS_0083_AreasOfArchaeologicalSensitivity.mxd

Annex B. Designated Heritage Assets

B.1 Scheduled Monuments within the 5km study area

NFID	LIST ENTRY	NAME	PERIOD	SCHEDULED	NATIONAL GRID REFERENCE (NGR)
1	1019665	Remains of the Medieval parish church and cemetery, 70m north east of the junction of Hall Close and Frinton Road	Medieval	16-Feb-2001	TM 20906 16656
2	1020688	Beaumont Quay, Hamford Water: a 19th century quay and lime kiln	Post Medieval	28-Jan-2003	TM 18964 24005
3	1016555	Martello tower F, Marine Parade West, Clacton-on-Sea	Post Medieval	17-Nov-1960	TM 17286 14298
4	1016554	Martello tower E, 300m south west of junction of Marine Parade West and Wash Lane, Clacton-on-Sea	Post Medieval	11-Nov-1960	TM 16714 13756
5	1016787	Martello tower K and associated battery south west of Walton Mere	Post Medieval	17-Nov-1960	TM 25078 22007, TM 25146 22036
6	1019882	World War II bombing decoy HA2 Kirby-le-Soken	Second World War	20-Jul-2001	TM 21847 23905 TM 21887 23914

B.2 Registered Parks and Gardens within the 5km study area

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)
7	1000521	Thorpe Hall	Thorpe-le-Soken	II	01-Jul-1987	TM 18224 21772
8	1001626	CLACTON SEAFRONT GARDENS	Clacton	II	28/06/2002	TM 17502 14435

B.3 Listed Buildings within the 5km study area

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
3	1111520	MARTELLO TOWER AND BRICK LINED MOAT	St. James, Tendring, Essex, CO15	II	04/07/1986	TM 17285 14297	
4	1337150	MARTELLO TOWER ADJACENT TO SEA WALL, BUTLINS HOLIDAY VILLAGE	St. James, Tendring, Essex, CO15	II	04/07/1986	TM 16714 13756	
9	1111548	TREASURE HOLT FARMHOUSE	Burrsville, Tendring, Essex, CO15	II	20/08/1976	TM1922017541	x
10	1111521	SLADBURY'S OLD HOUSE	Burrsville, Tendring, Essex, CO15	II	04/07/1986	TM 19681 18088	x
11	1337148	CARTLODGE OPPOSITE AND APPROXIMATELY 30 METRES NORTH WEST OF SLADBURY'S OLD HOUSE	Burrsville, Tendring, Essex, CO15	II	04/07/1986	TM 19792 17924	x
12	1337116	GREAT HOLLAND LODGE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 21144 18749	x
13	1165610	CHURCH OF ALL SAINTS	Frinton and Walton, Tendring, Essex, CO13	II*	21/06/1950	TM 21918 19356	x

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
14	1337117	TUDOR COTTAGES	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21458 19355	x
15	1165657	MANOR FARMHOUSE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 21298 19246	x
16	1317222	HOUSE NOW KNOWN AS RING COTTAGE AND TUDOR COTTAGE TO THE NORTH EAST OF FORMER CHAPEL AND WEST OF TRACK TO NATURE RESERVE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 20358 19001	x
17	1111532	GREAT HOLLAND MILL HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM2036419333	x
18	1111531	THE HOMESTEAD	Frinton and Walton, Tendring, Essex, CO13	II*	18/05/1979	TM 23353 19396	x
19	1111530	CHURCH OF ST MARY	Frinton and Walton, Tendring, Essex, CO13	II*	21/06/1950	TM 23718 19483	x
20	1337115	THE ROUND HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 24533 20551	
21	1392229	SEASPAN	Frinton and Walton, Tendring, Essex, CO13	II	30/08/2007	TM 24542 20637	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
22	1376783	55, QUENDON WAY	Frinton and Walton, Tendring, Essex, CO13	II	18/12/1997	TM 24438 20720	
23	1165599	THE COUNCIL HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	27/05/1982	TM 23959 21162	
24	1317153	ASHES	Frinton and Walton, Tendring, Essex, CO14	II	04/07/1986	TM 23920 21674	
25	1111503	CHURCH OF ALL SAINTS	Frinton and Walton, Tendring, Essex, CO14	II	04/07/1986	TM 25215 21666	
26	1111506	BARKER'S MARINE HOTEL	Frinton and Walton, Tendring, Essex, CO14	II	20/07/1982	TM 25473 21717	
27	1111508	40-44, THE PARADE	Frinton and Walton, Tendring, Essex, CO14	II	30/07/1975	TM 25525 21783	
28	1309165	GUN FLEET	Frinton and Walton, Tendring, Essex, CO14	II	30/07/1975	TM 25530 21790	
29	1165832	GOTHIC HOUSE	Frinton and Walton, Tendring, Essex, CO14	II	04/07/1986	TM 25529 21900	
30	1317129	15 AND 17, SAVILLE STREET	Frinton and Walton, Tendring, Essex, CO14	II	01/06/1950	TM 25517 21926	
31	1111505	ST DOMINICS	Frinton and Walton, Tendring, Essex, CO14	II	04/07/1986	TM 25469 21940	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
32	1111504	MARTELLO TOWER	Frinton and Walton, Tendring, Essex, CO14	II	01/06/1950	TM 25080 22011	
33	1317175	1-6 Penrice Court and 2-7 East Terrace	Frinton and Walton, Tendring, Essex, CO14	II	29/05/1975	TM2588422307	
34	1111507	UNITED REFORMED CHURCH	Frinton and Walton, Tendring, Essex, CO14	II	04/07/1986	TM 25373 21664	
35	1165773	GOTHIC COTTAGE	Frinton and Walton, Tendring, Essex, CO14	II	29/05/1975	TM 25873 22356	
36	1455213	Old Lifeboat House	Frinton and Walton, Tendring, Essex, CO14	II	15/06/2018	TM2596422483	
37	1337140	THATCHED COTTAGES AT CORNER OF GREEN LANE	Frinton and Walton, Tendring, Essex, CO14	II	01/06/1950	TM 25914 22490	
38	1165720	THATCHED COTTAGE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 22724 22364	
39	1111539	STREET HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 22310 22003	
40	1165726	Post Office House	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM2207122107	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
41	1111497	THE RED LION PUBLIC HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 22009 22147	
42	1111498	RED HOUSE WHITE HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21912 22170	
43	1111499	MEADOW VIEW COTTAGE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21870 22167	
44	1337137	NORTON'S BARN OPPOSITE AND APPROXIMATELY 40 METRES NORTH WEST OF PATCHES	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21710 22225	
45	1111500	CHURCH OF ST MICHAEL	Frinton and Walton, Tendring, Essex, CO13	II*	22/06/1950	TM 21960 22033	
46	1111501	MEMORIAL PLAQUE AND ENCLOSING RAILINGS, ATTACHED TO EXTERNAL EAST WALL OF CHANCEL BELOW EAST WINDOW CHURCH OF ST MICHAEL	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21976 22032	
47	1165674	LINNETS HOTEL	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21826 20833	
48	1111502	KIRBY HALL	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21813 21971	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
49	1111535	TUDOR COTTAGE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21466 20906	
50	1111536	APPLETREE COTTAGE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM2123720998	
51	1165700	PLUMTREE COTTAGE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21226 20998	
52	1111537	MILL HOUSE	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 21077 21019	
53	1317210	RED ROOFS	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21024 21088	
54	1111534	178, THORPE ROAD	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 20695 21157	
55	1317215	BLUE HOUSE FARMHOUSE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 20576 21189	
56	1111538	WHITE LADIES	Frinton and Walton, Tendring, Essex, CO13	II	01/06/1950	TM 20528 21162	
57	1307196	THORPE PARK FARMHOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 18860 21082	
58	1337143	RICEBRIDGE COTTAGE	Little Clacton, Tendring, Essex, CO16	II	11/09/1985	TM 17962 21105	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
59	1385961	MALTINGS TO WEST OF RAILWAY STATION	Thorpe-le-Soken, Tendring, Essex, CO16	II	27/10/1998	TM 17804 21348	
60	1147615	ELM FARMHOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	22/07/1983	TM 18501 22112	
61	1147822	TORTWORTH	Thorpe-le-Soken, Tendring, Essex, CO16	II	02/01/1973	TM 18129 22208	
62	1112115	BOWLING GREEN COTTAGE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 18099 22187	
63	1322618	THE ABBEY	Thorpe-le-Soken, Tendring, Essex, CO16	II*	29/04/1952	TM 18064 22286	
64	1147779	IVY COTTAGE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 18049 22239	
65	1112113	OAKLEY HOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	07/05/1985	TM 18029 22247	
66	1147774	THE TROSSACHS	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 18008 22251	
67	1380567	POLICE STATION	Thorpe-le-Soken, Tendring, Essex, CO16	II	28/06/2000	TM 18079 22412	
68	1147653	THORPE BAPTIST CHURCH	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 17985 22380	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
69	1112110	LOBLOLLIES	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 17969 22342	
70	1112112	THE BELL HOTEL	Thorpe-le-Soken, Tendring, Essex, CO16	II*	29/04/1952	TM 17968 22310	
71	1147716	PARISH CHURCH OF ST MICHAEL	Thorpe-le-Soken, Tendring, Essex, CO16	II*	30/01/1987	TM 17929 22294	
72	1322622	NOS 1 AND 2 CHURCH COTTAGES, TRINITY BYEGONES AND 'THE GRANARY' WHOLEFOOD STORE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM1793222341	
73	1112111	MILL HOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	29/04/1952	TM 17871 22369	
74	1147697	THE OAKS RESTAURANT AND THE OLD BAKEHOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM1785122384	
75	1322620	NORFOLK HOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	01/12/1962	TM 17826 22430	
76	1308437	GOWER HOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 17812 22434	
77	1322621	LE SOKEN ANTIQUES	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM1778722425	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
78	1308410	ASHDONAND HOMELEIGH	Thorpe-le-Soken, Tendring, Essex, CO16	II	07/05/1985	TM1778122429	
79	1112078	GREEN STEAD	Thorpe-le-Soken, Tendring, Essex, CO16	II	08/08/1990	TM1775722449	
80	1112109	HAWTHORNS	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 17727 22519	
81	1112108	COMARQUES	Thorpe-le-Soken, Tendring, Essex, CO16	II*	29/04/1952	TM 17489 22640	
82	1322619	THE OLD VICARAGE	Thorpe-le-Soken, Tendring, Essex, CO16	II	11/06/1981	TM 17505 22761	
83	1147589	MILLINGTON HOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM1698023124	
84	1112107	THORPE GREEN HOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 16934 23057	
85	1147596	BARNARD'S FARMHOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 16793 22174	
86	1235348	BROOK FARMHOUSE	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 15424 22502	
87	1235277	DALE BROW	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 15269 22557	
88	1235273	WEELEY HOUSE	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 14664 22072	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
89	1265109	THE ANCIENT HOUSE	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 14649 22149	
90	1265107	CHURCH OF ST ANDREW	Weeley, Tendring, Essex, CO16	II*	17/11/1966	TM 15418 21528	
91	1265154	MONUMENT 1 METRE SOUTH OF SOUTH WALL OF ST ANDREW'S CHURCH	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 15425 21521	
92	1265073	HILLSIDE HOUSE	Weeley, Tendring, Essex, CO16	II	21/12/1990	TM 14999 21203	
93	1235339	POND FARMHOUSE	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 15061 21023	
94	1435296	Weeley War Memorial	Weeley, Tendring, Essex, CO16	II	23/08/2016	TM1502921021	
95	1235272	FERNCROFT	Weeley, Tendring, Essex, CO16	II	10/04/1987	TM 15472 20596	
96	1337134	WYLEY COTTAGE	St. Osyth, Tendring, Essex, CO16	II	02/01/1986	TM 15062 19742	
97	1166121	HIGH BIRCH FARMHOUSE	St. Osyth, Tendring, Essex, CO16	II	04/07/1986	TM 14014 19408	
98	1166118	WELCHES	St. Osyth, Tendring, Essex, CO16	II	04/07/1986	TM1383418508	
99	1111485	CHISBON HOUSE	St. Osyth, Tendring, Essex, CO16	II	04/07/1986	TM1413318265	

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100	1111510	BOVILL'S HALL	Little Clacton, Tendring, Essex, CO16	II	17/11/1966	TM 15844 17986	
101	1111511	PIG STIES APPROXIMATELY 50 METRES WEST OF BOVILL'S HALL	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 15792 17987	
102	1309179	BARN APPROXIMATELY 30 METRES NORTHWEST OF BOVILL'S HALL	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 15811 18006	
103	1165889	STONE HALL	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 16656 18326	
104	1111509	WESTBOURN COTTAGE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 16682 18773	
105	1165915	CHURCH OF ST JAMES	Little Clacton, Tendring, Essex, CO16	II*	17/11/1966	TM 16612 18820	
106	1165910	ORCHARD LEA	Little Clacton, Tendring, Essex, CO16	II	25/04/1974	TM 16619 18990	
107	1111512	KINFAUNS COTTAGES	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 16538 19163	
108	1337146	SWAINS FARMHOUSE	Little Clacton, Tendring, Essex, CO16	II	02/09/1985	TM 16390 19292	

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109	1165971	AMERELL'S FARMHOUSE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 16339 19676	
110	1309142	CLACTON GROVE HOUSE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 17295 19674	
111	1337145	Barn approximately 50 metres north of Clacton Grove House	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM1733019724	
112	1337144	PARKGATE FARMHOUSE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 18207 19273	x
113	1165880	REEDLANDS FARMHOUSE	Little Clacton, Tendring, Essex, CO16	II	04/07/1986	TM 17751 18893	x
114	1111523	OAK HOUSE	Burrsville, Tendring, Essex, CO16	II	04/07/1986	TM1799118459	x
115	1111551	WILLOW FARMHOUSE	Burrsville, Tendring, Essex, CO15	II	04/07/1986	TM1854918142	x
116	1337124	THE ROBERT BURRE	Burrsville, Tendring, Essex, CO15	II	10/01/1951	TM 18671 17419	x
117	1165560	THE OAKWOOD INN	St. Bartholomew's, Tendring, Essex, CO15	II	04/07/1986	TM 20218 16792	x
118	1111529	LITTLE HOLLAND HALL	St. Bartholomew's, Tendring, Essex, CO15	II	26/10/1973	TM 20876 16690	x

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
119	1111518	ROW OF 5 STREET LIGHTS SOUTH SIDE OF ESPLANADE BETWEEN LANCASTER GARDENS AND CONNAUGHT GARDENS	St. Paul's, Tendring, Essex, CO15	II	04/07/1986	TM1873015277	
120	1111552	THE MOOT HALL	St. Paul's, Tendring, Essex, CO15	II	14/03/1983	TM 18632 15282	
121	1380565	COLCHESTER INSTITUTE MAIN BUILDING	St. Paul's, Tendring, Essex, CO15	II	11/07/2000	TM 18118 14908	
122	1271909	Roman Catholic Church of Our Lady of Light and St Osyth	Pier, Tendring, Essex, CO15	II	16/06/1997	TM1791314891	
123	1420919	Lych Gate at Our Lady of Light and St Osyth	Pier, Tendring, Essex, CO15	II	26/11/2014	TM1789314860	
124	1267903	CLACTON TOWN HALL	Pier, Tendring, Essex, CO15	II	19/11/1996	TM 17564 15074	
125	1337125	1, COPPINS ROAD	Coppins, Tendring, Essex, CO15	II	11/05/1982	TM 17208 15556	
126	1448050	Clacton-on-Sea War Memorial	St. James, Tendring, Essex, CO15	II	03/07/2017	TM1760314518	
127	1257896	CHURCH OF ST JAMES	St. James, Tendring, Essex, CO15	II*	05/03/1997	TM 17221 14528	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
128	1111519	ROW OF 16 STREET LIGHTS SOUTH SIDE OF ESPLANADE BETWEEN BEACH ROAD AND WEST ROAD	St. James, Tendring, Essex, CO15	II	04/07/1986	TM1729014230	
129	1317258	383, OLD ROAD	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17596 16329	
130	1337153	FORGE COTTAGE	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17730 16390	
131	1111526	THE SHIP INN	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17668 16415	
132	1337151	THE MALTINGS AND SHOP ON CORNER OF ST JOHNS ROAD, ATTACHED TO AND	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17641 16454	
133	1317265	CROWN TOP HAIRDRESSERS PAGE ESTATE AGENTS REWARDS RESTAURANT	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17628 16463	
134	1111528	SADDLERS COTTAGE	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17614 16466	

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135	1337152	CHURCH HOUSE ST JOHNS HOUSE TERRYS DIY SHOP	St. John's, Tendring, Essex, CO15	II	26/10/1973	TM 17652 16497	
136	1317259	CHURCH OF ST JOHN THE BAPTIST	St. John's, Tendring, Essex, CO15	I	04/07/1986	TM 17708 16529	
137	1111525	GREAT CLACTON HALL	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17690 16570	
138	1165532	THE QUEEN'S HEAD HOTEL	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17589 16495	
139	1317272	THREE CHIMNEYS	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17563 16472	
140	1165521	THE PLOUGH	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17583 16522	
141	1111549	CANN HALL	Cann Hall, Tendring, Essex, CO16	II*	04/07/1986	TM1665516747	
142	1337149	BLUEHOUSE FARMHOUSE ADJACENT TO EAST OF CLACTON GARDEN CENTRE	Bluehouse, Tendring, Essex, CO16	II	04/07/1986	TM 15396 16071	
143	1111522	DUCHESS FARMHOUSE	Tendring, Essex, CO16	II	04/07/1986	TM 14848 15994	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
144	1309075	HOUSE BELIEVED TO BE KNOWN AS EARLS HALL LODGE	St. Osyth, Tendring, Essex, CO16	II	04/07/1986	TM 14354 16516	
145	1111527	YEW TREES	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17452 16523	
146	1337126	THE ROBIN HOOD	St. John's, Tendring, Essex, CO15	II	04/07/1986	TM 17207 16846	
147	1165663	HILL FARMHOUSE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM2211721513	
148	1111533	PENFOLD COTTAGES	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM2195521074	
149	1337138	THE OLD VICARAGE	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21901 22002	
150	1337118	WILLOW FARMHOUSE	Frinton and Walton, Tendring, Essex, CO13	II	21/06/1950	TM 21720 20835	
151	1337139	BARN APPROXIMATELY 80 METRES SOUTH WEST OF KIRBY HALL	Frinton and Walton, Tendring, Essex, CO13	II	04/07/1986	TM 21750 21908	
152	1337142	BLUE SHUTTERS	Frinton and Walton, Tendring, Essex, CO14	II	01/06/1950	TM 25521 21917	

NFID	LIST ENTRY	NAME	LOCATION	GRADE	LISTING DATE	NATIONAL GRID REFERENCE (NGR)	ASSETS WITHIN OR IMMEDIATELY ADJACENT TO THE CABLE LANDFALL SEARCH AREA
153	1322624	MILL BARN FARMHOUSE	Thorpe-le-Soken, Tendring, Essex, CO16	II	06/08/1985	TM 17745 22162	
154	1147807	GULL COTTAGES	Thorpe-le-Soken, Tendring, Essex, CO16	II	11/11/1981	TM 19886 23827	
156	1147789	LANDERMERE HALL	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 19472 23446	
157	1112116	LANDERMERE COTTAGE	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM1946523014	
158	1112114	KINGSHEAD	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM 19881 23864	
159	1112073	NEW HALL	Thorpe-le-Soken, Tendring, Essex, CO16	II	30/01/1987	TM1931823146	

Annex C. Non-designated Heritage Assets

NFID	MONUID	RECORD TYPE	MONUMENT TYPE	SUMMARY	PERIOD	EASTING	NORTHING
167	MEX1034365	FS	FINDSPOT	Three pieces of possible worked flint	Lower Palaeolithic to Late Bronze Age	618253	218499
168	MEX1049125	LND	NATURAL FEATURE	Site of the former Gunfleet estuary, used as a port and haven in the Medieval period, gradually silted up in the Post Medieval period	Early Mesolithic to Post Medieval	619498	219458
169	MEX9978	FS	FINDSPOT	Partly polished axe, found at Great Hall Farm.	Neolithic	622000	219000
170	MEX9986	FS	FINDSPOT	Butt end of polished axe head, from Great Holland.	Neolithic	621000	219000
171	MEX1042635	PAS	FINDSPOT	Folded gold ribbon	Bronze Age	618713	218891
172	MEX1042780	PAS	FINDSPOT	Late Bronze Age date axe head	Late Bronze Age	621600	218700
173	MEX21962	FS	FINDSPOT	Perforated stone axe, Bronze Age	Bronze Age	622700	219000
174	MEX12263	FS	FINDSPOT	Macehead.	Unknown	621000	219000
175	MEX12240	FS	FINDSPOT	Chipped flint axe found in ploughsoil; of black flint with retouched butt of which the point is broken.	Prehistoric	619300	217500
176	MEX1040021	MON	DITCH	Iron Age ditch and loom weight fragment found.	Iron Age	618282	218557
177	MEX1034363	FS	FINDSPOT	Fieldwalking and Geophysical Survey found only a single sherd of Roman greyware.	Roman	618253	218499
178	MEX10618	MON	FIELD BOUNDARY; RING DITCH; RECTANGULAR ENCLOSURE	Cropmarks of Ring ditches, 4 have central pits, a rectangular enclosure and a field system.	Early Medieval to Modern	619165	219240

NFID	MONUID	RECORD TYPE	MONUMENT TYPE	SUMMARY	PERIOD	EASTING	NORTHING
179	MEX1049127	MON	LANDING POINT	Landing-place on the Gunfleet Estuary, accessed from Wood Lane, Little Clacton.	Medieval to Post Medieval	619484	219317
180	MEX1049131	MON	LANDING POINT	Landing place at Sladburys Farm on the Gunfleet estuary	Medieval to Post Medieval	619996	218119
181	MEX1049132	MON	LANDING POINT	Landing place on the Gunfleet Estuary linked by lane to Pond House, Clacton-on-Sea	Medieval to Post Medieval	620036	217337
182	MEX1049133	MON	LANDING POINT	Landing place for Lower Farm, on the Gunfleet Estuary	Medieval to Post Medieval	620796	217454
183	MEX1049134	MON	LANDING POINT	Landing place accessed from the Clacton Road, on the Gunfleet estuary	Medieval to Post Medieval	621676	217817
184	MEX1049135	MON	LANDING POINT	Landing Place associated with Great Holland Hall	Medieval to Post Medieval	622233	218814
185	MEX1049136	MON	LANDING POINT	Landing place at Lower Barn, on the former Gunfleet Estuary	Medieval to Post Medieval	622897	218622
186	MEX1042143	LND	MARSH	"An area of grazing marsh along the former tidal reaches of the Holland Brook and Holland Haven, including a mixture of improved grassland and relict salt marsh. "	Medieval to Post Medieval	621109	217712
187	MEX1042145	LND	MARSH	"A small area of highly improved grassland in Holland Haven, including a mixture of improved grassland and relict salt marsh. Reclamation is likely to be 18th century or later. Sea defences have beach huts and paths built on them."	Medieval to Post Medieval	621632	217076
188	MEX1049141	MON	BRIDGE	Fan Bridge is second earliest crossing of the Holland Brook.	Medieval to Modern	619707	218667

NFID	MONUID	RECORD TYPE	MONUMENT TYPE	SUMMARY	PERIOD	EASTING	NORTHING
				First recorded in 1509 and shown on Norden's map of 1594.			
189	MEX1040022	MON	GULLY; HEARTH; OVEN; STRUCTURE; DITCH; DITCH	A small rectangular structure with a burnt patch which was either a hearth or the base of an oven.	Medieval to Post Medieval	618282	218557
190	MEX1031361	MON	TRACKWAY; LINEAR FEATURE; PIT; SITE	Cropmark of linear feature	Medieval	621424	218190
191	MEX1031368	MON	FIELD BOUNDARY; LINEAR FEATURE; SITE	Cropmarks of possible linear feature	Medieval	618738	218168
192	MEX13203	MON	FIELD BOUNDARY; TRACKWAY; SITE	Single large ring ditch with trackway to the south running north east to south west.	Medieval	621241	218907
193	MEX10655	MON	FIELD BOUNDARY; EXTRACTIVE PIT; ENCLOSURE	Sub-rectangular enclosure with entrance to SE, possible small ring ditches..	Medieval	620439	218299
194	MEX1034364	FS	FINDSPOT	Medieval finds found during fieldwalking.	Medieval to Post Medieval	618253	218499
195	MEX1044665	PAS	FINDSPOT	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval to Post Medieval	620400	218600
196	MEX1046478	PAS	FINDSPOT	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post Medieval to Unknown	621000	219000

NFID	MONUID	RECORD TYPE	MONUMENT TYPE	SUMMARY	PERIOD	EASTING	NORTHING
197	MEX1046476	PAS	FINDSPOT	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post Medieval to Unknown	620400	218600
198	MEX1049138	IND	COPPERAS WORKS; SETTLING PIT	Site of Mr Barton's Pans, Holland Haven, at the mouth of the former Gunfleet Estuary. Thought to be copperas settling pans.	Post Medieval	622672	217991
199	MEX1049142	MON	BRIDGE; BOUNDARY MARKER	Site of 18th century bridge across the Holland Brook	Post Medieval to Modern	621012	217211
200	MEX9950	MON	FARMHOUSE	On earlier map called Treasure Holt Farm.	Post Medieval	619218	217561
201	MEX1039273	MON	MARTELLO TOWER	Site of Martello tower built in 1810-12 demolished in 1819.	Post Medieval	622792	218122
202	MEX1039274	MON	BATTERY; MARTELLO TOWER	Site of Martello tower built in 1810-12 demolished in 1819.	Post Medieval	621900	217200
203	MEX1039298	MON	PILLBOX	WWI pillbox.	Modern	619353	217271
204	MEX31496	MON	PILLBOX (TYPE FW3/22)	Standing on the top of the sea wall overlooking the North Sea is a hexagonal concrete type FW3/22 pillbox	Modern	622460	217760
205	MEX31495	MON	PILLBOX	There is the base of a pillbox on top of the sea wall.	Modern	622430	217680
206	MEX1034361	MON	PILLBOX (TYPE FW3/22)?	An hexagonal pillbox, probably a type FW3/22, on the seashore under the cliff face.	Modern	621830	217140
207	MEX1034362	MON	PILLBOX (TYPE FW3/22)	An hexagonal FW3/22 pillbox, probably with a protective ÔÇÿskirtÔÇÖ, on the cliff edge at Holland Haven.	Modern	622040	217380

NFID	MONUID	RECORD TYPE	MONUMENT TYPE	SUMMARY	PERIOD	EASTING	NORTHING
208	MEX31493	MON	PILLBOX (TYPE FW3/22)	Wills lists a "polygonal, concrete pillbox facing SE at TM 222 175".	Modern	622120	217470
209	MEX31492	MON	PILLBOX (TYPE FW3/22)	A hexagonal, concrete type FW3/22 pillbox.	Modern	622000	217440
210	MEX1034360	MON	PILLBOX	Contemporary records state, "2 pillboxes, OS No. 250 part of Beach Farm, Great Holland".	Modern	621261	217671
211	MEX49905	MON	HEAVY ANTI AIRCRAFT BATTERY	WWII Heavy Anti-Aircraft gun site	Modern	621574	217042
212	MEX1031358	MON	DIVER SITE	'Diver' site K13.	Modern	621242	217524
213	MEX1040009	MON	DIVER SITE	WWII Diver site	Modern	623130	218560
214	MEX49906	MON	MINEFIELD	WWII minefield	Modern	621290	217194
215	MEX10636	MON	LINEAR FEATURE; RING DITCH; OVAL ENCLOSURE; RECTANGULAR ENCLOSURE; SITE	Linear features-possible remains of a field system.	Unknown	618856	218587
216	MEX1050178	MON		Evaluation revealed a focus of Medieval activity and BA activity. Excavation to follow.	Unknown	618201	218498
217	MEX10628	MON	PIT; RING DITCH; SITE	Double ditched trackways, pits, ring ditches.	Unknown	619302	218032
218	MEX1031371	MON	LINEAR FEATURE; SITE	Cropmarks of linear features	Unknown	619548	217560
219	MEX10602	MON	TRACKWAY; LINEAR	Field system, part of which is present on the OS map (1967).	Unknown	619274	217018

NFID	MONUID	RECORD TYPE	MONUMENT TYPE	SUMMARY	PERIOD	EASTING	NORTHING
			FEATURE; PIT; SITE				
220	MEX10626	MON	LINEAR FEATURE; PIT; SITE	Mainly geological features some possible archaeological features - linear features and pits.	Unknown	621617	219048
221	MEX1031407	MON	LINEAR FEATURE; FIELD BOUNDARY; SITE	Cropmark of geological marks	Unknown	621462	218895
222	MEX10609	MON	TRACKWAY; RING DITCH; HOUSE; PIT; SITE	Broad double ditched trackway aligned almost N-S, possible pennanular ditches some formed out of "pit" settings in circular formation, pits scattered across field.	Unknown	620751	218849
223	MEX10111	MON	EARTHWORK	Circular earthwork.	Unknown	622069	217444
224	MEX1049137	MON	MOUND	Oval mound of unknown date north of Fan Bridge	Unknown	619573	218771
225	MEX1032054	MON	WOOD	A site visit to Little Holland Brook Flood drainage site revealed no definite archaeological features.	Unknown	621057	217155
226	MEX1034366	FS	FINDSPOT	The site produced very few finds from fieldwalking.	Unknown	618372	218304

Annex D. Air Photo Services report

AIR PHOTO SERVICES

Archaeology • Research • Law • Environment • Planning

North Falls

Offshore Windfarm

Onshore Project Components

Scoping Report:

Assessment of Aerial Imagery for Archaeology

Report: APS 221 05 02

September 2021

NORTH FALLS OFFSHORE WINDFARM
ONSHORE PROJECT COMPONENTS
Assessment of Aerial Imagery for Archaeology

Client	Royal Haskoning DHV on behalf of North Falls Offshore Windfarm Limited (NFOW)
Client Project Reference Local Authority	PB9244 Tendring District Council
Air Photo Services Document	221 05 01 - 01
Air Photo Services Project Number	221 05 01
Site centre National Grid Reference (NGR)	TM 208180
Co-ordinates	620855,218000

Report Status	FINAL
Issue date	2021 09 08
Report prepared by	Chris Cox MA MCIfA FSA, Adam Jarvis ACIfA
Interpretation and Mapping prepared by	Adam Jarvis ACIfA
QA checked by	Chris Cox MA MCIfA FSA (interpretation and mapping) and Nereide Gilhead ACCA Affil. CIfA (report)

Disclaimer

This report has been prepared by Air Photo Services Ltd with all reasonable skill, care and diligence within the terms of the contract with the client, incorporation of our General Terms and Conditions of Business and taking account of the resources devoted to us by agreement with the client. We disclaim any responsibility to the client and others in respect of matters outside the scope of the above. This report is confidential to the client and we accept no responsibility for the actions and opinions of third parties, to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

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Glossary of abbreviations

APS	Air Photo Services Ltd
ArcGIS	Artificial Intelligence Geographic Information System
ASCII	American Standard Code for Information Interchange
CRS	Coordinate Reference System
CSV	Comma Separated Value file
CUCAP	Cambridge University Collection of Aerial Photography
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
DXF	Drawing Exchange Format
EA	Environment Agency
EPSG	European Petroleum Survey Group
GIS	Geographic Information System
EHER	Essex Historic Environment Record
ERO	Essex Records Office
LiDAR	Light Detection And Ranging
NA	The National Archives
NFOW	North Falls Offshore Windfarm Ltd
NGR	National Grid Reference
NLP	National LiDAR Programme
NMP	(Historic England) National Mapping Programme
OS	Ordnance Survey
MonUID	EHER site reference
QGIS	Quantum Geographic Information System
RVT	Relief Visualisation Toolbox
SLRM	Simple Local Relief Model
WWII	World War Two (1939 – 1945)

Summary

S1. Air Photo Services Ltd (APS) was commissioned to undertake an assessment of airborne remote sensing and satellite imagery data alongside historic map regression analysis, as a scoping procedure for the Onshore Scoping Area (hereafter referred to as 'the Site') for the North Falls Offshore Wind Farm.

S2. The site lies to the east of the Essex coast between Clacton-on-Sea and Frinton-on-Sea and is shown on **Figure 1.**

S3. This report represents the work undertaken by APS between May and July 2021.

S4. The object of this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised Airborne Laser Scan (ALS) which is also known as Light Detection And Ranging (LiDAR) data to assess the topographic and micro topographic features within the Site.

S5. Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates. Features dating to the prehistoric, medieval, Post Medieval and modern periods have been identified and mapped. Some of these features have been previously identified by the Essex Historic Environment Record (EHER) and Essex National Mapping Programme (ENMP) survey.

S6. The assessment identified 19 areas of archaeological interest which are detailed below in **Table 1**.

Table 1: Summary of sites within the Landfall search area

APS_Site	Asset type	Condition on last recorded data source	Period	EHER MonUID
APS_01	Pits, possibly minefield	Levelled, grassmark	WWII	MEX49906
APS_02	Field system	Levelled, cropmark	Post Medieval	MEX10602 MEX1031371
APS_03	Anti-Aircraft defence site	Former structure, now levelled, crop and grassmark	WWII	MEX1031358
APS_04	Field system	Levelled, cropmark	Post Medieval	
APS_05	Field System, settlement features (enclosures) and ring ditches	Levelled, cropmark	Prehistoric – Post Medieval	MEX10628 MEX1031371
APS_06	Round barrow	Levelled, cropmark	Prehistoric	MEX10628
APS_07	Pit	Levelled, cropmark	Unknown, possible prehistoric (Bronze Age)	MEX10628

APS_Site	Asset type	Condition on last recorded data source	Period	EHER MonUID
APS_08	Square Enclosure	Levelled, cropmark	Medieval	MEX1031368
APS_09	Field System, trackway, boundaries	Levelled, cropmark	Prehistoric/unknown overlain by Post Medieval fields	MEX10655 MEX10609
APS_10	Field System, track	Levelled, cropmark	Post Medieval/Modern	MEX1031361
APS_11	Field System	Levelled, cropmark	Post Medieval	MEX10636 MEX1031368
APS_12	Round barrow	Levelled, cropmark	Prehistoric	MEX10636
APS_13	Ring ditch, likely round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10636

APS_Site	Asset type	Condition on last recorded data source	Period	EHER MonUID
APS_14	Field system, square enclosure	Levelled, cropmark	Post Medieval	MEX13203
APS_15	Field system	Residual earthwork via LiDAR data	Post Medieval	
APS_16	Ditches, possible buried settlement	Levelled, cropmark	Medieval/Modern	MEX10618
APS_17	Round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10618
APS_18	Field system	Residual earthwork *via* LiDAR data	Medieval/Modern	
APS_19	Ring ditch	Levelled, cropmark	Possible prehistoric (Bronze Age)	

S7. Map regression analysis shows that the landscape within the site is one of established smaller rural fields, and in the coastal hinterland has been under arable cultivation, with drained land and marshes flanking the coast and Holland Brook. The small hamlets, farms and settlements have been stably present, and the settlements at

Bursville Park and Holland-on-Sea to the south of the area have developed since the 1960s.

S8. After 1967, the landscape began to open-up with the removal of large areas of Post Medieval field boundaries which changed the rural environment that had been established following land enclosure, making the way for modern mechanised agricultural cultivation methods.

S9. The later coloured Ordnance Survey (OS) maps indicate the hydrological features graphically, showing the drainage and character of this coastal hinterland area.

1. Introduction, aims and objectives

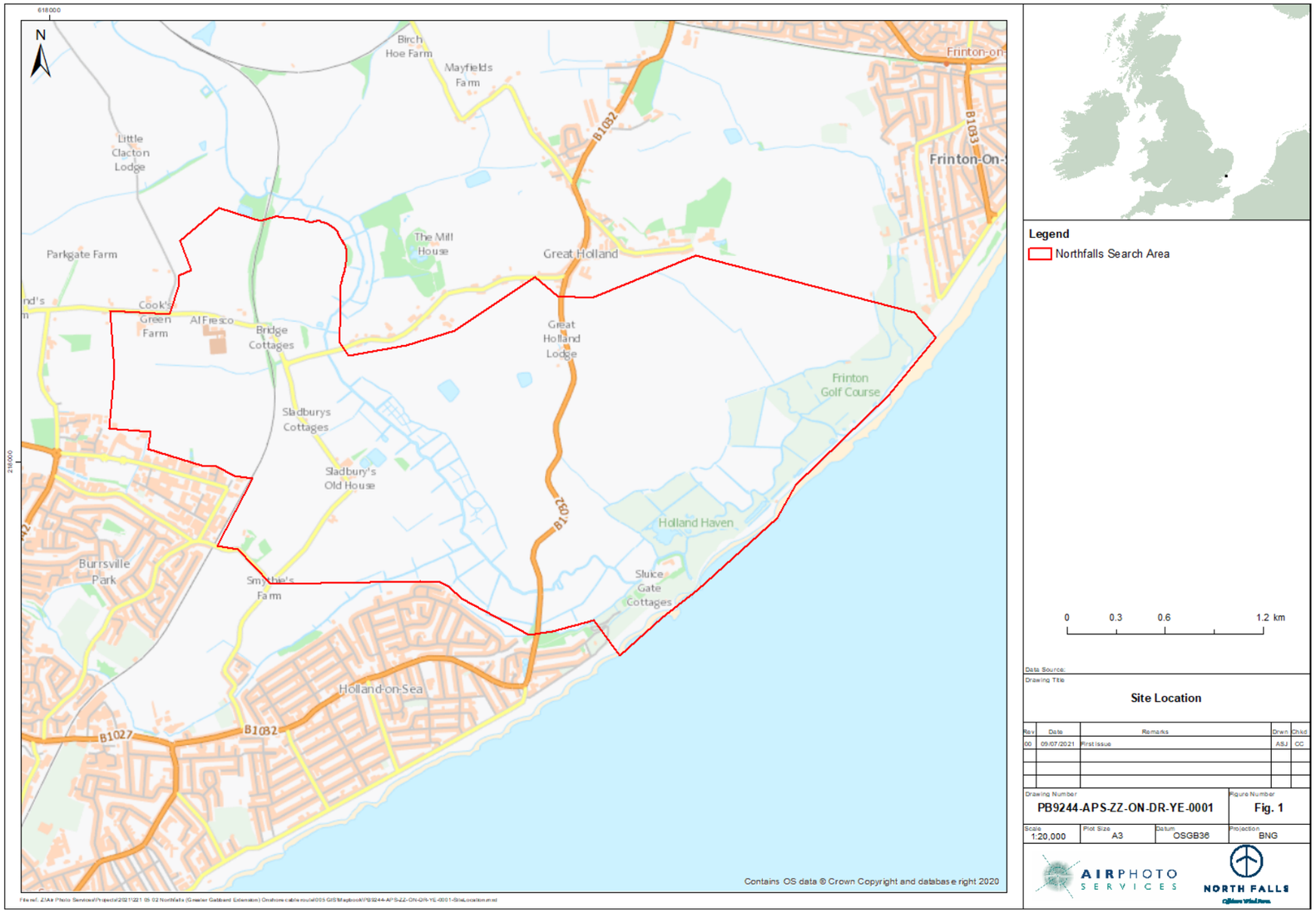
1.1. Air Photo Services Ltd (APS) was commissioned to undertake an assessment of airborne remote sensing and satellite imagery data alongside historic map regression analysis, as a scoping procedure for the Onshore Scoping Area (hereafter referred to as 'the Site') for the North Falls Offshore Wind Farm.

1.2. The Site lies to the east of the Essex coast between Clacton-on-Sea and Frinton-on-Sea and is shown on **Figure 1**.

1.3. This scoping report represents the work undertaken by APS between May and July 2021.

1.4. The object of this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised Airborne Laser Scan (ALS) which is also known as Light Detection and Ranging (LiDAR) data to assess the topographic and micro topographic features within the Site.

Figure 1 Site location



Aims and objectives

1.5. The aim of this scoping report was to provide information on the location and nature of buried and upstanding archaeological features visible on historic aerial photographs, modern aerial and satellite imagery and visualised LiDAR data to assess the buried, topographic and micro topographic features within the Site.

1.6. The analysis aimed to assess the present level of preservation of the buried historic landscape in the study area. This was assessed in respect of the considerable landscape change wrought by intense arable farming over much of the Site to the west of the coast.

1.7. The objective of this report is to identify the potential for heritage asset presence and preservation through the assessment of aerial imagery, LiDAR data and map regression analysis.

2. Sources of data

2.1. The **Appendix** to this report details:

- The data sources which were consulted, and their metadata as appropriate;
- Methodologies employed; and
- Conclusions drawn from the data acquisition and processing.

2.2. In summary, the assessment systematically examined the following sources of data:

- Historic and modern aerial photographs *via* online sources;
- Satellite imagery *via* online sources;
- Specialist oblique, military oblique and vertical aerial photographs held at the Historic England Archive in Swindon, under enquiry number 128957, the locations of which are shown on **Figure 2**;
- Online search of the Cambridge University Collection of Aerial Photographs (CUCAP) database at https://www.cambridgeairphotos.com/map/ which generates a Comma Separated Value file (CSV) file showing the locations of vertical and oblique aerial photographic surveys and site targets which are shown on **Figure 3**. This collection remains in long term closure during its digitisation in Cambridge and it is not possible to see any of the actual images at the time of writing. However, these images have been examined by the Essex National Mapping Programme (NMP) Tendring Extension project;
- Oblique aerial photographs taken during the course of specialist surveys by Helen Saunders at Essex Council, which were provided digitally as high quality scans. The locations of these obliques are shown on **Figure 4**;
- Search data as Shape (SHP) and Portable Document Format (PDF) files from the Essex Historic Environment Record (EHER);
- Department for Environment, Food and Rural Affairs (DEFRA) georeferenced digital aerial imagery data were consulted, and the location of this aerial imagery layer is shown on **Figure 5**;

- The Essex National Mapping Programme (NMP) was used as baseline data (Ingle and Saunders 2003), and covers the whole of the Site. This project was an early NMP, begun in 1993, and interpretation continued to 2017 with the Tendring Enhancement add-on to the original data;.
- Environment Agency (EA) and National LiDAR Programme (NLP) LiDAR data were available as shown at **Figure 6**, and were captured in 1999 (2m resolution), and then at 1m resolution in 2010, 2016, 2017, 2018 (NLP) and 2020;
- Enclosure Maps were not available for consultation in the Essex Records Office (ERO) during the timescale of this assessment.
- The Little Clacton Tithe map was made available as an exception to current large document availability rules, by the Essex Records Office, and was consulted alongside large scale vertical aerial photographs taken in 1945, at the ERO;
- The Great Holland Tithe map will be added to the records in due course to complete the map regression; and
- Envirocheck digital Historical Map reports.

Figure 2 Historic England aerial photograph coverage

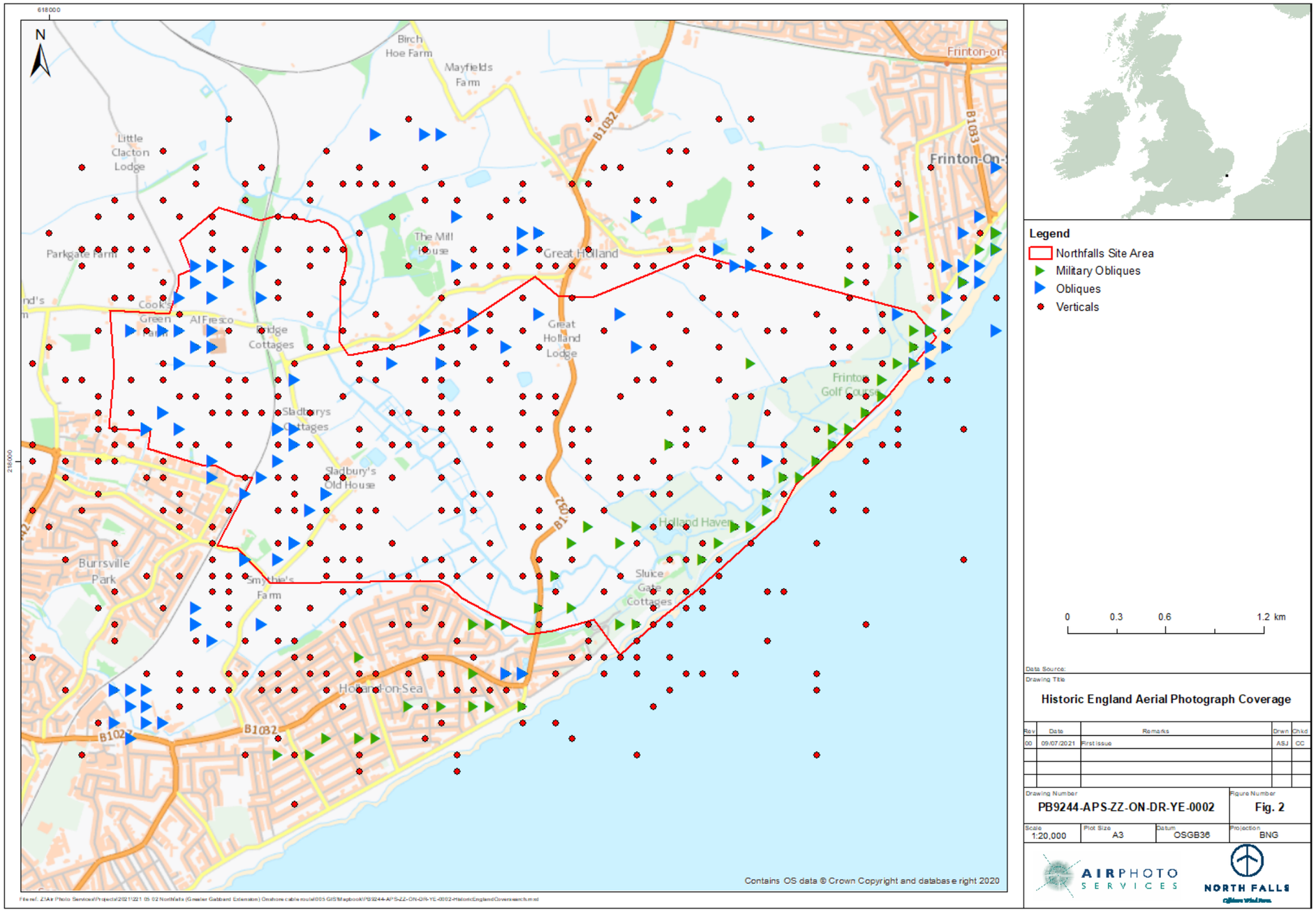


Figure 3 Cambridge University Collection of Aerial Photographs (CUCAP) coverage

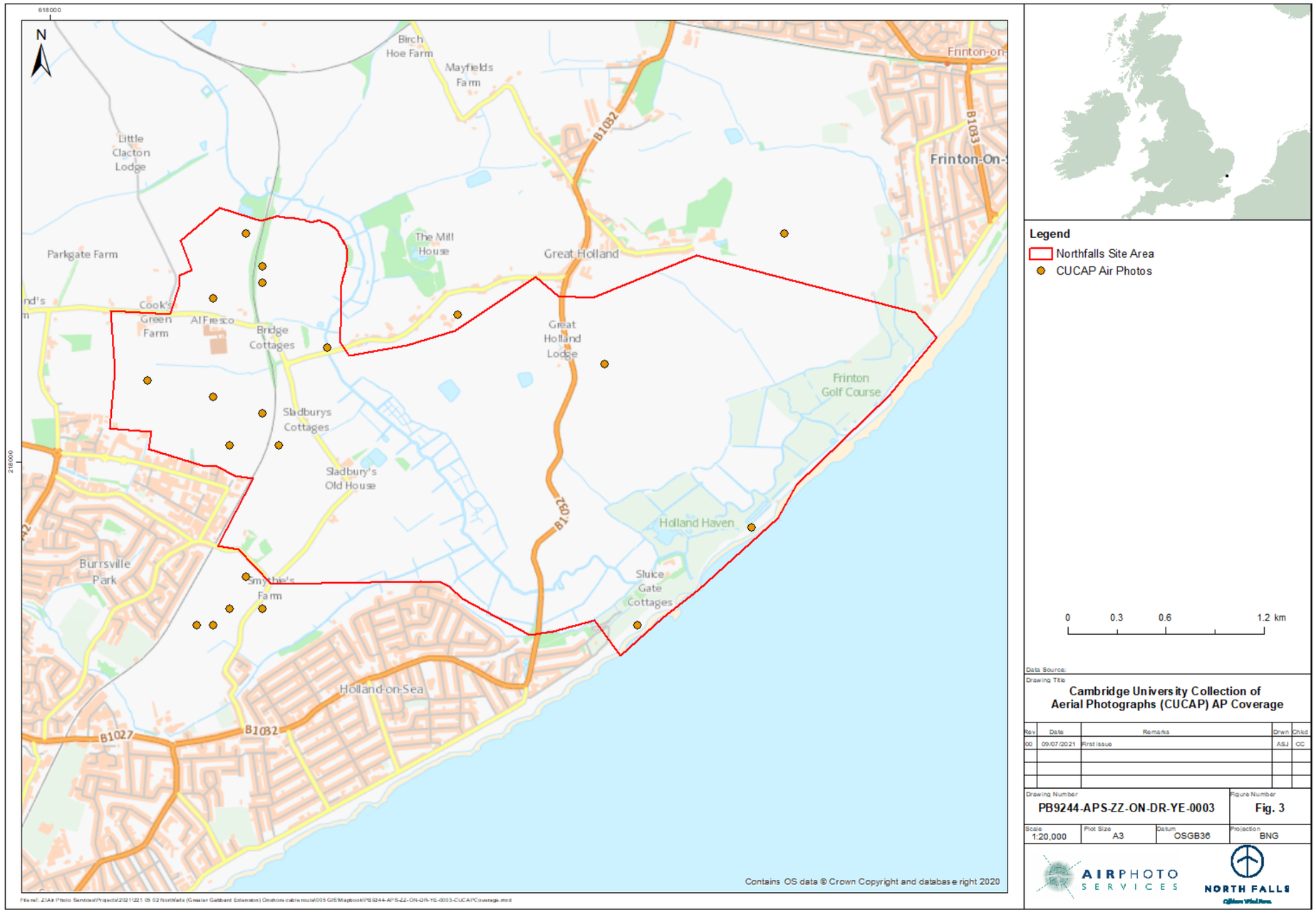


Figure 4 Essex Council aerial photographic coverage

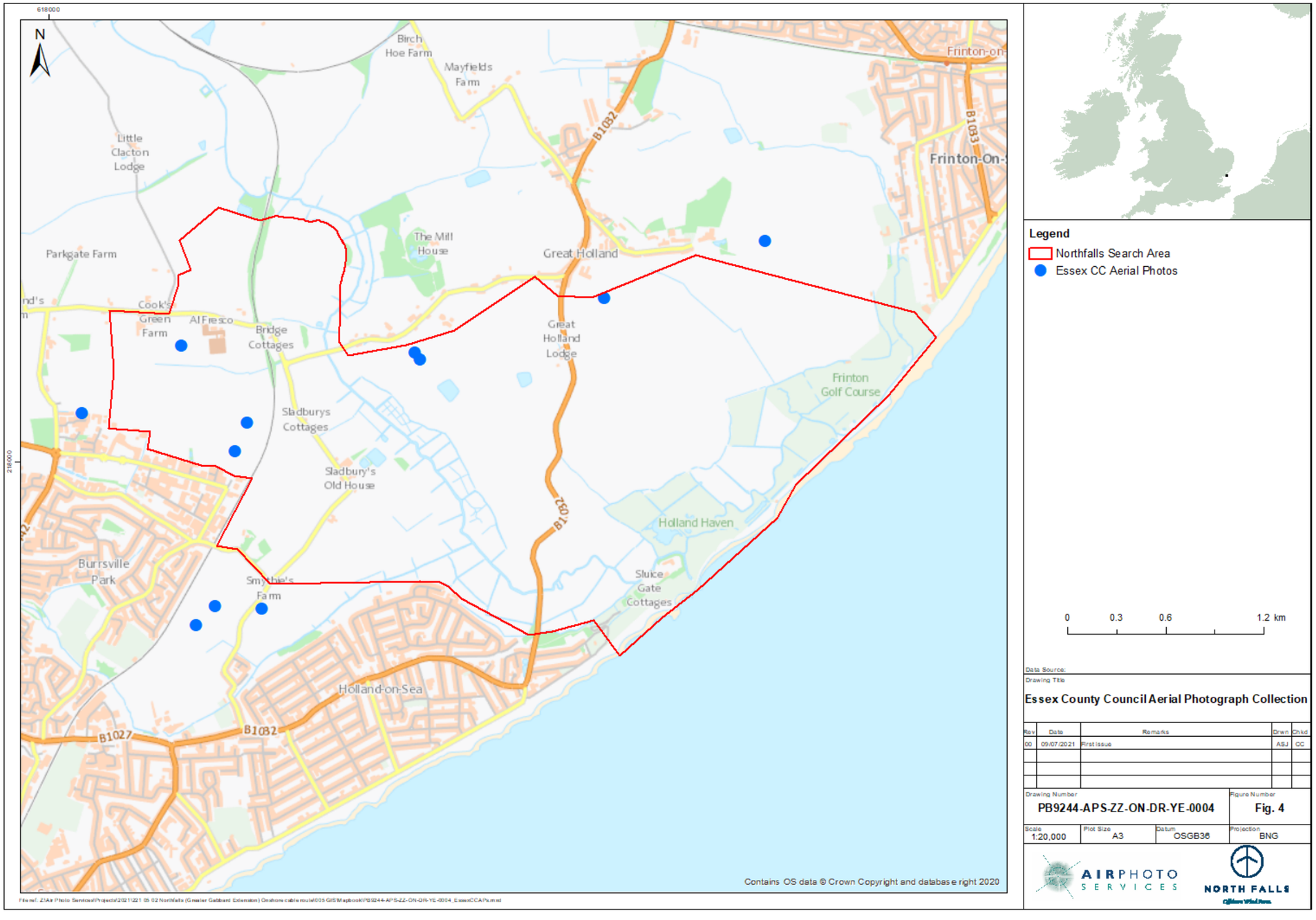


Figure 5 DEFRA vertical aerial photograph coverage

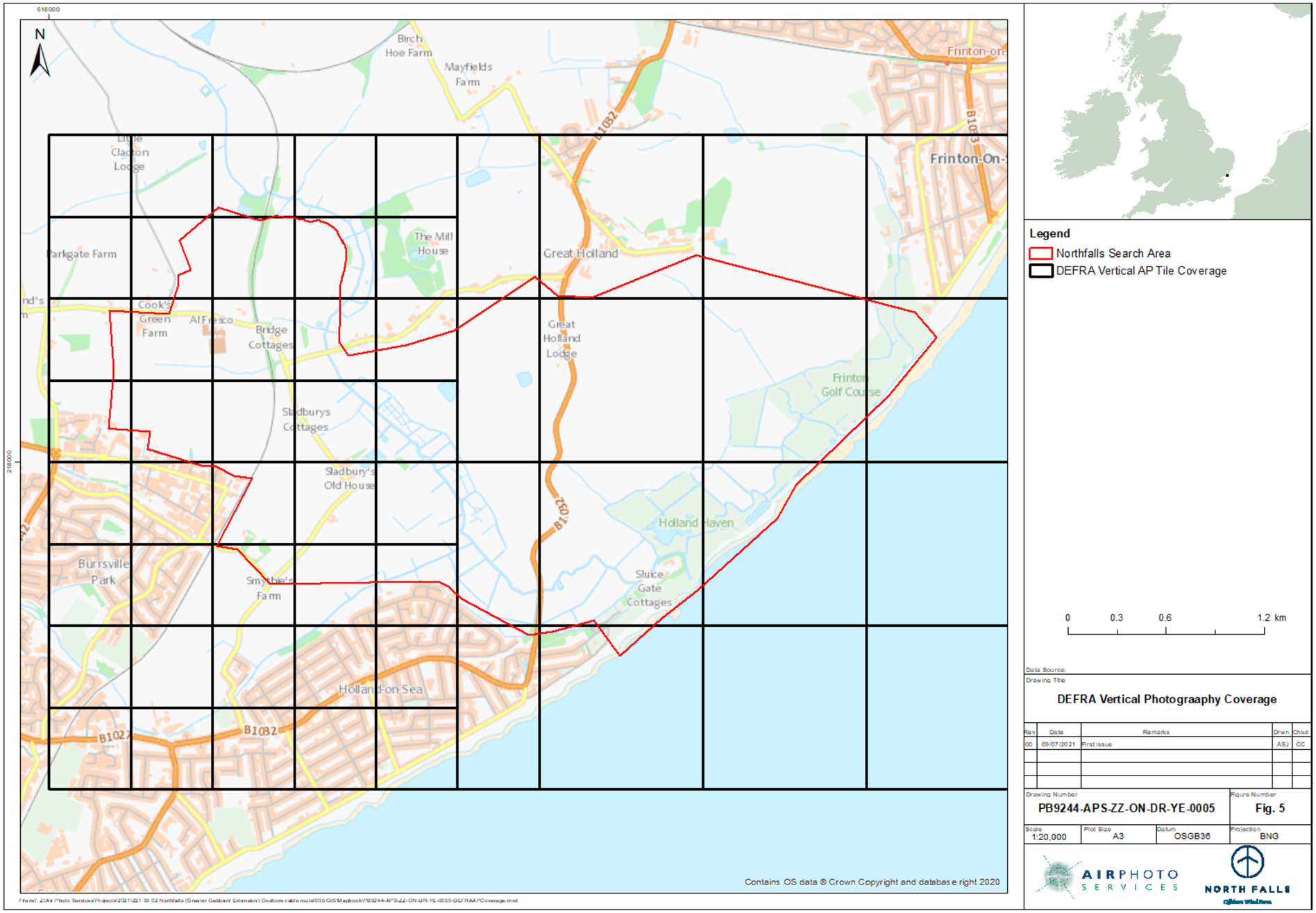
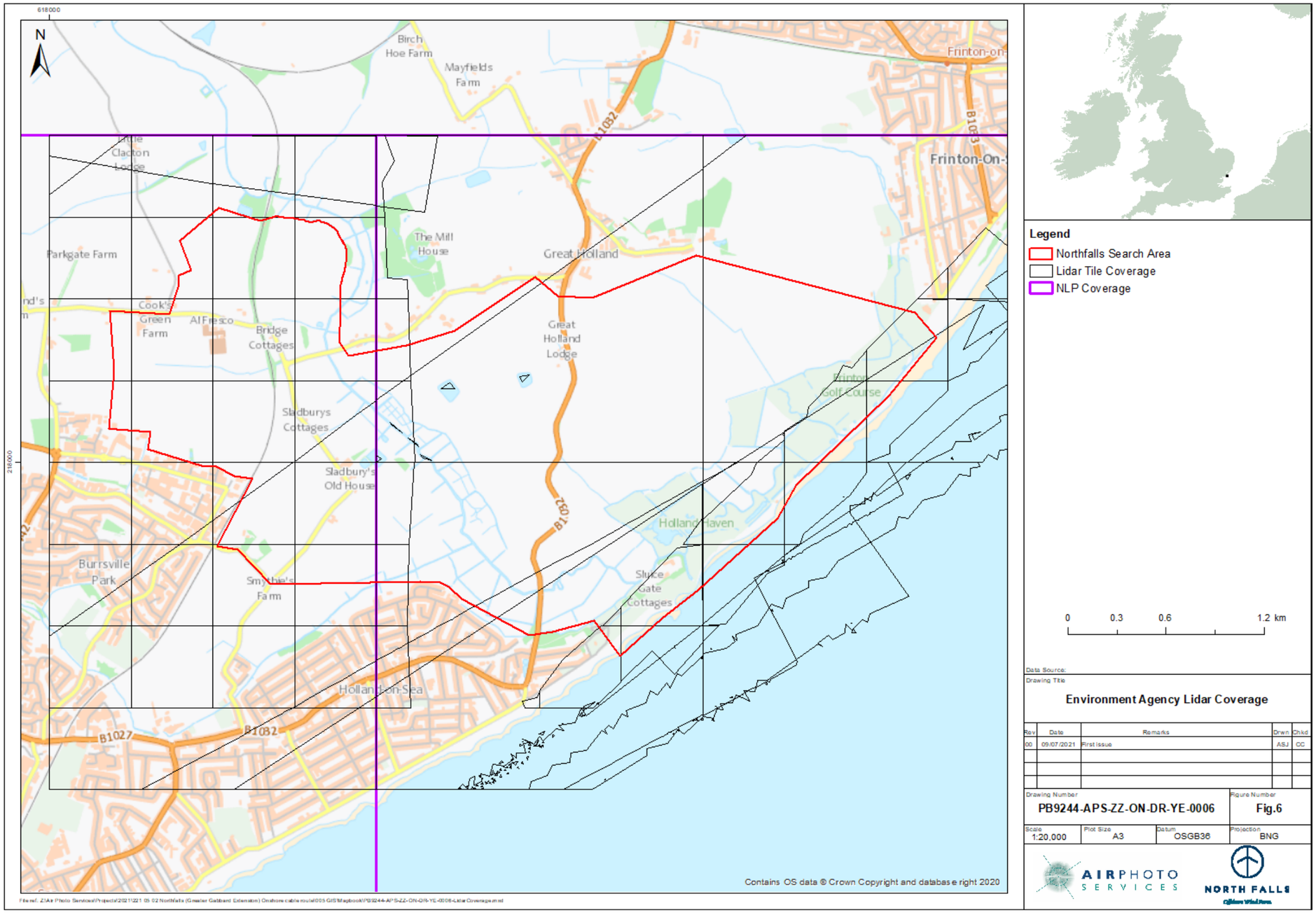


Figure 6 Environment Agency LiDAR data coverage



3. Interpretation and mapping summary

3.1. All photos, satellite images and LiDAR data visualisations were interpreted and mapped at a level compatible with a 1:2500 scale base map.

3.2. Aerial photographs were closely examined by eye and under 1.5x and 3x magnification and interpreted with the aid of a mirror stereoscope where appropriate, or in detail on screen when consulted as digital files.

3.3. Aerial photographs were digitally rectified to an OS base map using the QGIS rectification tool. This was done to remove perspective distortion and ensure correct rectification of aerial photographs to the OS map (Scollar 2002 and 2014). Images from Google Earth were also interpreted and rectified to OS map bases and used in accordance with observations made by Scollar and Palmer, 2008.

3.4. In all transformations prepared for this assessment the mean mismatches were less than ± 2.5m. The rectified files were set as background layers in QGIS where features were interpreted and drawn over the rectified photographs.

3.5. The Essex NMP data were taken into careful consideration, used as baseline data and updated where appropriate from newer data sources.

3.6. Layers from the final drawing have been used to prepare the illustration for this report and are provided digitally for import to a Geographic Information System, in ESRI Shapefile format. The details of the sources, processing and content of the Shapefiles is detailed in the **Appendix** to this report.

3.7. LiDAR data were downloaded, visualised and imported to QGIS and ArcGIS for interpretation and mapping.

3.8. Methods of acquisition, processing, transcription and interpretation are detailed in the **Appendix** to this report at **Section 13**, alongside a discussion of the limitation of each survey technique for archaeological discovery and mapping.

4. Environment and known heritage assets

4.1. The nature of the environment has a complex effect on both the preservation and visibility of both buried and upstanding features from the air. Many factors combine to influence very marked seasonal and temporal limitations to visibility of cropmarks[1] soil marks[2] and earthworks[3]. Land use, agricultural regimes, weather, geology and soil types are all major contributing factors to the visibility of heritage assets from airborne and satellite-derived sources.

Topography and Land Use

4.2. The Site lies within a hinterland to the North Sea coast between Great Clacton, Great Holland and Frinton-on-Sea. This very gently undulating land rises from sea level to between 5 and 20m Above Ordnance Datum (AOD) to the west of the coast.

4.3. In the east near the coast the area is partially drained reclaimed land, with a pumping station, wildlife sanctuaries, coastal leisure areas and golf facilities between Holland Gap, Sandy Point, Chevaux de Frise Point, Holland Haven Country Park and Holland Haven. The coast is subject to erosion, and at times flooding, from the sea, and was defended particularly during WWII against potential maritime and airborne invasion forces.

4.4. To the west of the coast, the land is predominately laid to arable use and drains into Holland Brook which traverses the centre of the area from Fen Bridge to Holland Bridge with isolated farms, nursery glasshouses and some small reservoirs near Lodge Farm and Sladbury's Old House. A local railway line traverses the western part of the area from Clacton to the northwest of Cooks Green and Dairy House.

[1] Where crops grow differentially over buried features such as ditches banks and walls and reveal the pattern of past sites and landscape in the colour and density of their growth.

[2] Differently coloured and toned soil which is part of buried features which are being directly brought to the surface by ploughing or erosion and are visible in contrast to the surrounding soil.

[3] Upstanding ditched and embanked features which show from the air *via* their shadows or *via* the differential topography revealed by visualised LiDAR data.

4.5. The area is served by small local access roads and the most major route, the modern B1032, runs northwards through the area from Holland-on-Sea to Great Holland.

Topography and Land Use Conclusion

4.6. The Study Area presents some optimal environments for early settlement on the slightly higher ground to the immediate west of the wildlife-rich coastal area.

4.7. The slightly higher ground is largely an optimum environment for the recording of buried features from the air, particularly as marks in crops following intensive use for cereal and other arable crop production. Both complex natural features and some detailed archaeological features are readily visible as marks in crops which reveal multi period settlement, agricultural, funerary and defensive land use dating from earlier prehistoric to modern periods.

Soils

4.8. The soils and substrates are reasonably well drained over areas of gravel deposits, are easily worked, and enjoy optimal access to watercourses.

4.9. The drift geologies **Figure 8** give rise to deep stoneless seasonally wet clayey soils over the coastal marine alluvium[4], seasonally wet deep clay over tertiary clays and river alluvium[5], and deep well drained loamy soils over glaciofluvial drift (gravel) areas[6] .

4.10. The soils are shown on **Figure 7**.

Geology

4.11. The drift deposits (Cranfield University 2021, British Geological Survey (BGS) 2021) comprise Marine Alluvium at the coast, River Alluvium to either side of Holland Brook, and tertiary clay, with areas of glacio-fluvial drift (gravel) over Eocene clay.

4.12. The extent, type and location of these deposits is shown on **Figure 8**.

[4] WALLASEA 1 813f soil type
[5] WINDSOR 712c soil type (marine) and FLADBURY 1 813b (river)
[6] WIX 572b soil type

Geology and soils conclusion

4.13. The soils in the Study Area present a mixed group of substrates with some soils better draining than others. The well-drained loamy soils over gravels provide slightly higher and better drained areas among some less well drained and more marshy areas over marine and river alluvium. Marks in crops over eroded buried features and removed field boundaries have been recorded on the areas which lie over gravel and some parts of the tertiary clay.

4.14. In this area of Essex, the gravel substrate within parts of the Site are well drained, and crops respond readily to differences in the depth and consistency of the top and sub soils, over areas where buried ditched and embanked features are present. This effect also applies to anomalies in the consistency of the substrate. Aerial images in this region show widespread marks in crops over large areas of anomalies which are caused by these geological patterns and anomalies in the gravel in what was a periglacial area (Stephens 1990 Chapter 4). These patterns are particularly visible in some areas of the Site and are discernible from cropmarks caused by archaeological features which are more regular and obviously anthropogenic but can be confusing and somewhat challenging to differentiate from the overlying buried field systems, tracks, ditched enclosures and funerary features.

Figure 7 Soils

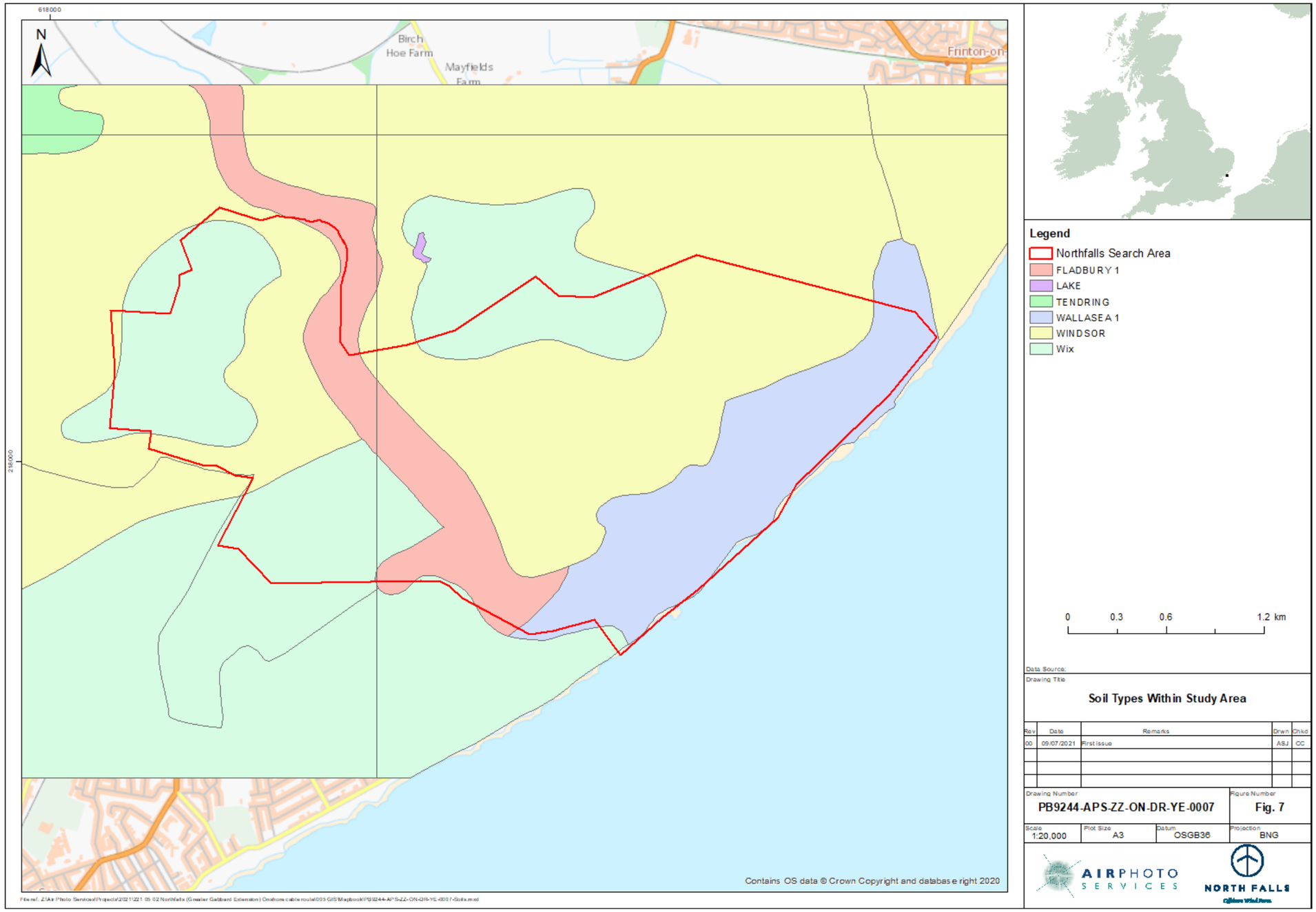
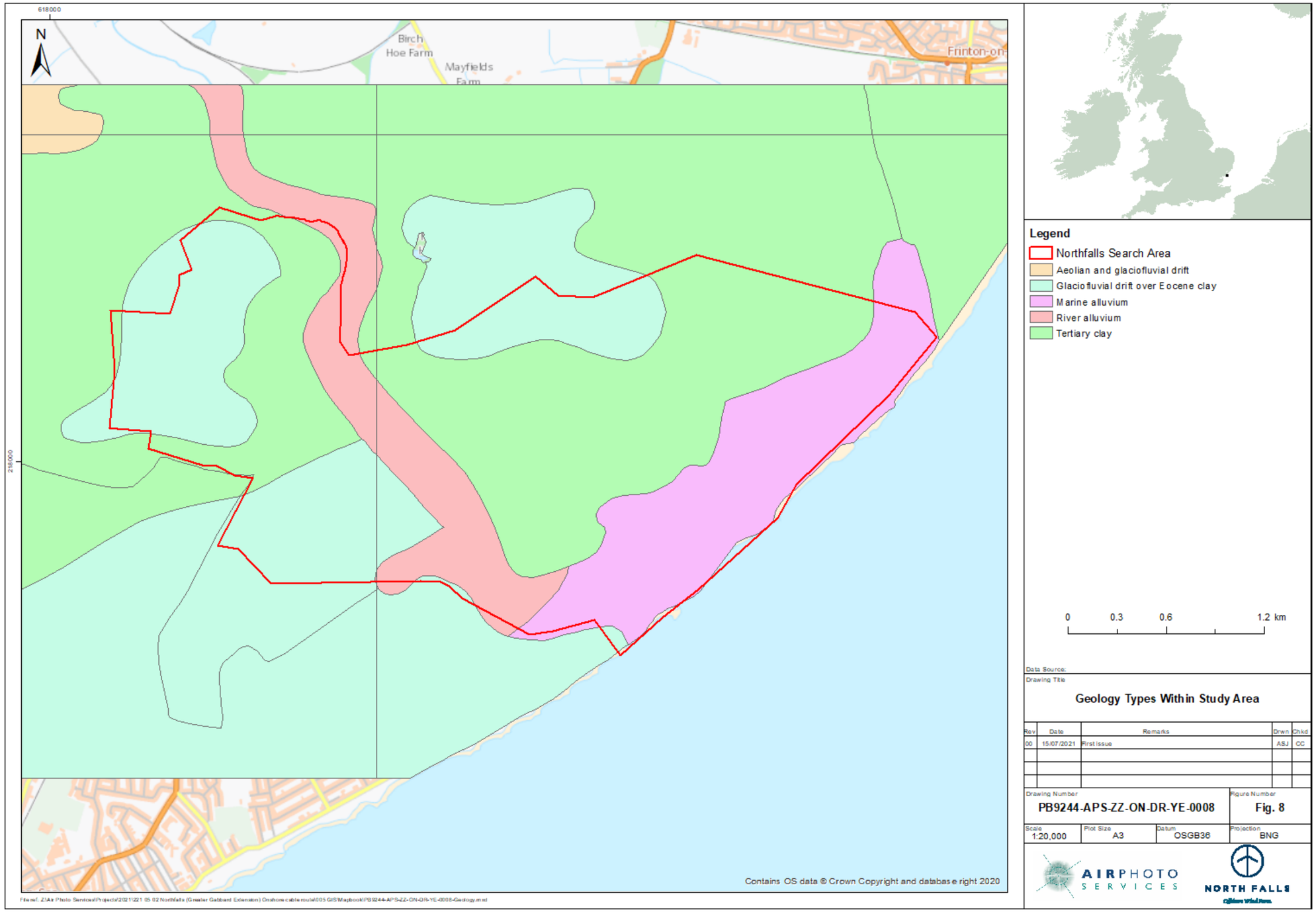


Figure 8 Geology



Previously recorded heritage assets

4.15. The EHER demonstrates that the Site contains known evidence for sites and landscapes which date from the earlier prehistoric through to modern periods. The historic landscape is characterised at the coast as pre 18th and 19th century drained and reclaimed land, with some areas of grazing salt marsh which sustain sheep farming.

4.16. Further areas of drained reclaimed land and areas with post-1950 boundary loss, with some relict elements, lie further inland among areas of bounded arable fields.

4.17. Arable areas show cropmarked remains of ring ditches which indicate likely Bronze Age funerary sites (round barrows) alongside ditched enclosures and tracks, such as those recorded around Cook's Green Farm (MEX101636), north of Bursville Park (MEX10628) and south of Dairy House Farm at MEX10655. These known sites have been recorded by the Essex NMP (Ingle and Saunders 2003) and the EHER, and represent the remains of a buried former landscape which likely dates from the Bronze and Iron Ages through to the Roman period, although some areas of cropmarks remain undated.

4.18. In later periods the expansion of more mechanised and widespread agriculture has led to the removal of post-enclosure field boundaries, particularly in the latter part of the 20th century.

4.19. The coast area and hinterland was robustly defended during the 19th and 20th centuries. It contains relict or previously observed and destroyed sites which include the site of a Martello tower (MEX100039273) which was built in 1810-12 and is now demolished, WWII defensive pillboxes, a minefield (MEX49906), and a former heavy anti-aircraft battery (MEX49905). A defensive 'Diver' site number K13 (MEX1031358), which was extant in the 1940s, is now visible only as parch marks on aerial photographs over the sites of the former Nissen huts and and-line gun platforms and their associated control huts.

Baseline heritage assets conclusion

4.20. Overall the HER demonstrates the range of archaeological resource in the area and has served as an important indication of the type of sites likely to be visible *via* airborne remote sensing data sources.

5. Results

5.1 The results from the interpretation and mapping are presented in **Table 2** and are illustrated by **Figures 9.1 – 9.6** which are indexed at **Figure 9.** The detailed sources and condition notes are recorded in the Shapefile which accompanies this report.

5.2 The fields in **Table2** comprise:

- APS Site Id;
- Stage 1 Id for information (this may be removed when all documents finalised);
- RHDHV Id (to be added);
- Figure number;
- Asset Type;
- Condition on last recorded data source;
- Period;
- EHER MonUID;
- NMP UID;
- Interpretation notes;
- Easting coordinates;
- Northing coordinates; and
- Six figure National Grid Reference (NGR).

Table 2: Sites identified within the site from aerial photographs, satellite imagery and visualised LiDAR data

APS_Site	RHDHV Id	Figure number	Asset type	Condition on last recorded data source	Period	EHER MonUID	NMP UID	Interpretation notes	Easting	Northing	NGR
APS_01	214	9.1	Pits, possibly minefield	Levelled, grassmark	WWII	MEX49906		Correspondence held at Essex Records Office details clearance of military defence works in this area, and what appears to be possible craters of exploded mines are visible on a 1946 photograph. These infilled pits which are visible as marks in grass are possibly filled craters following clearance	621250	217231	TM 212 172
APS_02	219 218	9.2	Field system	Levelled, cropmark	Post Medieval	MEX10602 MEX1031371	2973 16991	Series of former field boundaries visible as extant boundaries in the 1940s and later as cropmarked ditches on aerial photographs and residual earthworks on Environment Agency LiDAR data. Several boundaries mapped by the NMP have been remapped and expanded on from earlier aerial photographic sources	619813	217428	TM 198 174
APS_03	212 210	9.1	Anti-Aircraft defence site	Former structure, now levelled, crop and grassmark	WWII	MEX1031358 MEX1034360	16984	Site of former WWII Anti-Aircraft Diver Battery K13, associated military camp and Nissen huts, removed by 1953. Remains of one of two recorded Pillboxes were visible until 2012 on aerial photographs, satellite imagery and LiDAR data. NMP has previously recorded the location of the gun emplacements. These have been adjusted from rectified photographs and the control huts, roads, pillbox and Nissen huts have been added for reference as these are no longer present and their subsurface remains show only as marks in grass and/or crops	621288	217622	TM 212 176

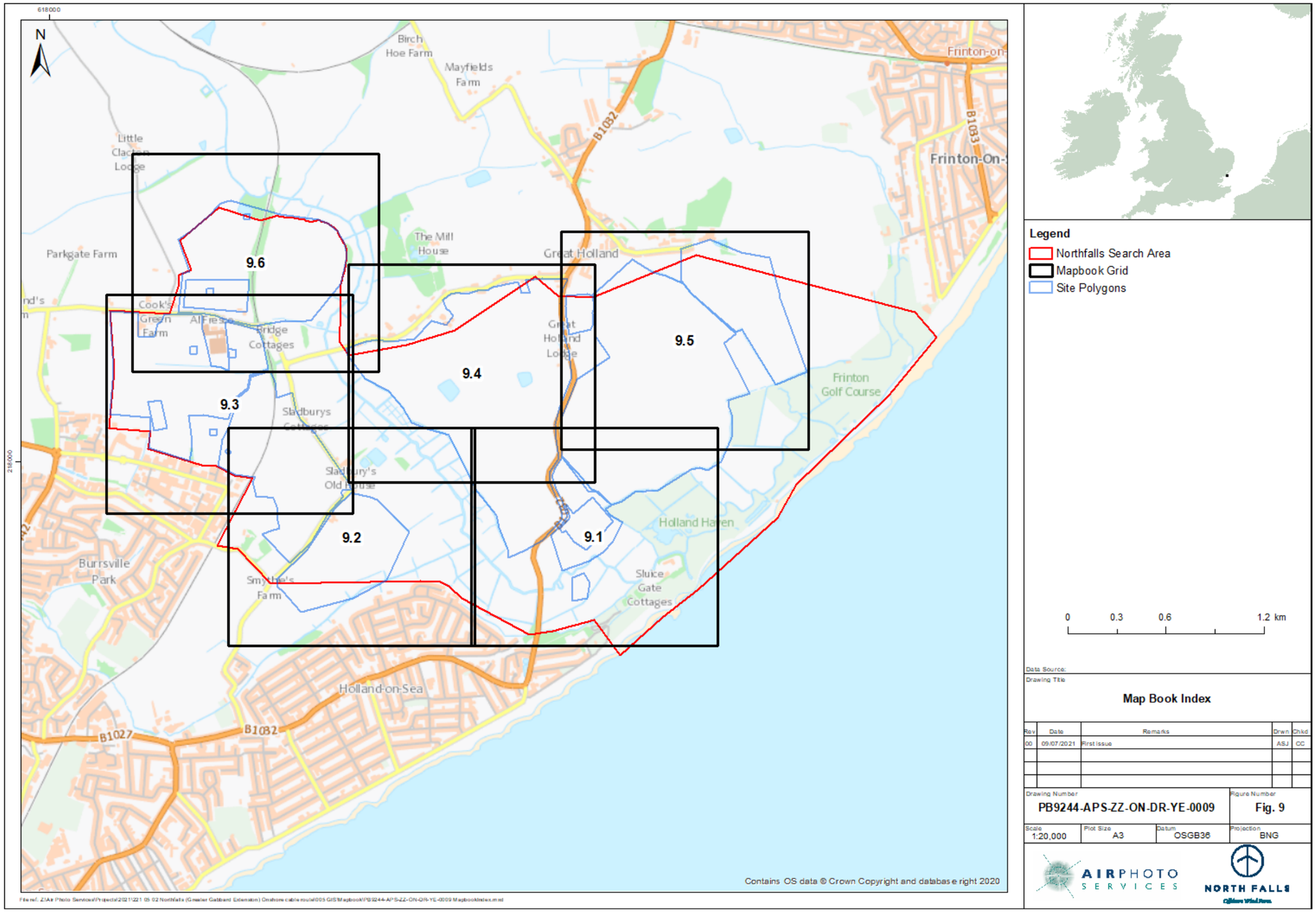
APS_04		9.1	Field system	Levelled, cropmark	Post Medieval			Area of Post Medieval field boundaries which are no longer extant. Visible as extant boundaries on 1940s and 50s aerial photographs and later as cropmarks from satellite imagery and residual earthworks from Environment Agency LiDAR data	621256	217641	TM 212 176
APS_05	217 218	9.2 9.3	Field System, settlement features (enclosures) and ring ditches	Levelled, cropmark	Prehistoric – Post Medieval	MEX10628 MEX1031371	2979 16991	Complex field system consisting of field boundaries, enclosures and ring ditches, visible on aerial photographs, satellite imagery and Environment Agency LiDAR. Area is heavily disturbed by geological cropmarks which may be masking archaeological features. There is also a large number of pits which remain unmapped as they may be natural. Areas of NMP have been remapped where possible for clarity and additions. Features which remain from the NMP could not be confirmed during reinterpretation	619425	217989	TM 194 179
APS_06	217	9.3	Round barrow	Levelled, cropmark	Prehistoric	MEX10628	2979	Ring ditch visible as a cropmark on aerial photographs. NMP has been remapped for clarity.	619092	218062	TM 190 180
APS_07	217	9.3	Pit	Levelled, cropmark	Unknown, possible prehistoric (Bronze Age)	MEX10628	2979	EHER records a possible round barrow or ring ditch based on cropmark evidence. However earlier aerial photographic evidence shows an extant earthwork at a possible extractive pit or pond. The area is heavily disturbed by geological cropmarks which may be masking archaeological features edges. The feature has been remapped from earlier sources showing the extent of the earthwork prior to it being eroded and only visible as a cropmark	619004	218181	TM 190 181

APS_08	191	9.3	Square Enclosure	Levelled, cropmark	Medieval	MEX1031368	16989	Possible square enclosure and ditches visible on oblique aerial photographs and recorded by the NMP. This area shows underlying geological disturbance which causes sinuous natural cropmarks around the enclosure making interpretation less certain	618660	218285	TM 186 182
APS_09	193 122	9.1 9.4	Field System, trackway, boundaries	Levelled, cropmark	Prehistoric/unknown overlain by Post Medieval fields	MEX10655 MEX10609	2975 2983	Field System which overlies earlier boundaries, trackways and possible pit alignments visible as cropmarks and soilmarks on aerial photographs, satellite imagery and visible as residual earthwork banks in Environment Agency LiDAR data. The area is heavily disturbed by geological cropmarks which may be masking archaeological features. There are also a large number of pits which remain unmapped as they may be natural features	620694	218408	TM 206 184
APS_10	190	9.1 9.5	Field System, track	Levelled, cropmark	Post Medieval / Modern	MEX1031361	16985	Former field boundaries visible on aerial photographs and satellite imagery as cropmarks and residual earthwork banks on Environment Agency LiDAR data. Former track has been recorded as two parallel cropmarked ditches by the NMP. The trackway was extant until the 1950s, mapped by the OS as removed in 1967, and marked as an agricultural track on the 1973 OS map	621683	218450	TM 216 184
APS_11	215 191	9.3	Field System	Levelled, cropmark	Post Medieval	MEX10636 MEX1031368	2980, 16989	Post Medieval field system consisting of boundaries, trackways and enclosures which are visible as cropmarks on aerial photographs and Satellite imagery, with residual earthwork remains visible on LiDAR data. Area is heavily disturbed by geological cropmarks which may be masking archaeological	618787	218530	TM 187 185

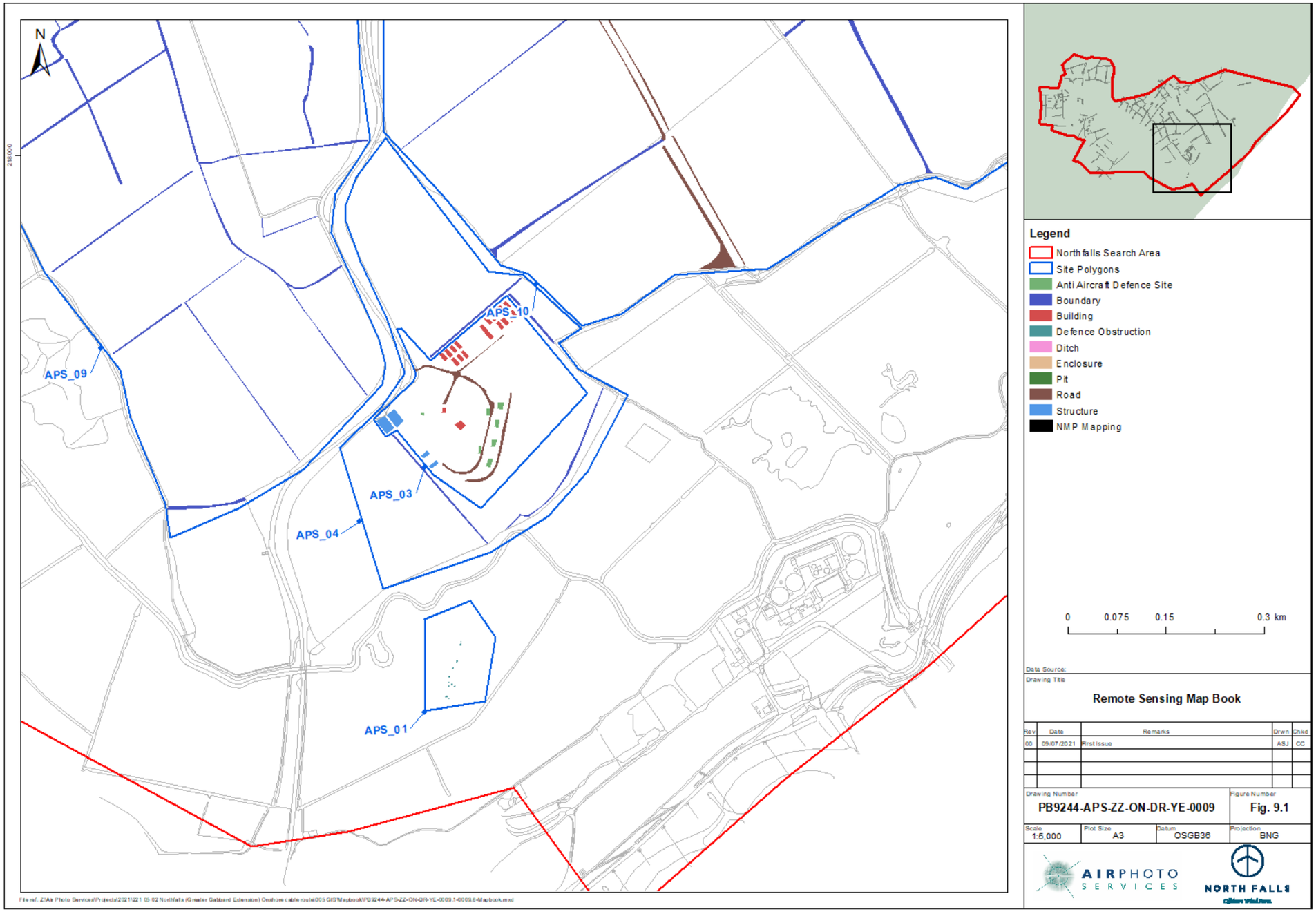
								features. There are also a small number of pits which remain unmapped as they are extensive and may be natural			
APS_12	215	9.3	Round barrow	Levelled, cropmark	Prehistoric	MEX10636	2980	Round barrow previously recorded by the NMP. Visible on multiple aerial photographs as a cropmarked ring ditch. Feature has been remapped for clarity of size	619117	218665	TM 191 186
APS_13	215	9.3	Ring ditch, likely round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10636		Ring ditch visible as a cropmark on a single oblique aerial photograph, which may be the remains of a round barrow	618882	218682	TM 188 186
APS_14	192	9.4	Field system, square enclosure	Levelled, cropmark	Post Medieval	MEX13203	3627	Square enclosures visible as cropmarks on aerial photographs, which are likely part of a post medieval field system which is depicted by the pre-1973 OS mapping. An underlying ditched feature is of unknown origin. Area is heavily disturbed by geological cropmarks which may be masking archaeological features. There is also a small number of pits which remain unmapped as they may be natural. NMP has been remapped and expanded upon from additional sources	621244	218913	TM 212 189
APS_15		9.5	Field system	Residual earthwork via LiDAR data	Post Medieval			Former field Boundaries visible as extant boundaries on 1940s aerial photographs, cropmarks on satellite imagery and residual earthworks on Environment Agency LiDAR data	622255	218979	TM 222 189
APS_16	178	9.6	Ditches, possible buried settlement	Levelled, cropmark	Medieval / Modern	MEX10618	2977	Series of ditches representing a possible enclosure are visible as cropmarks on aerial photographs. Area is heavily disturbed by geological cropmarks which may be masking further archaeological features. There are several pits	619026	219024	TM 190 190

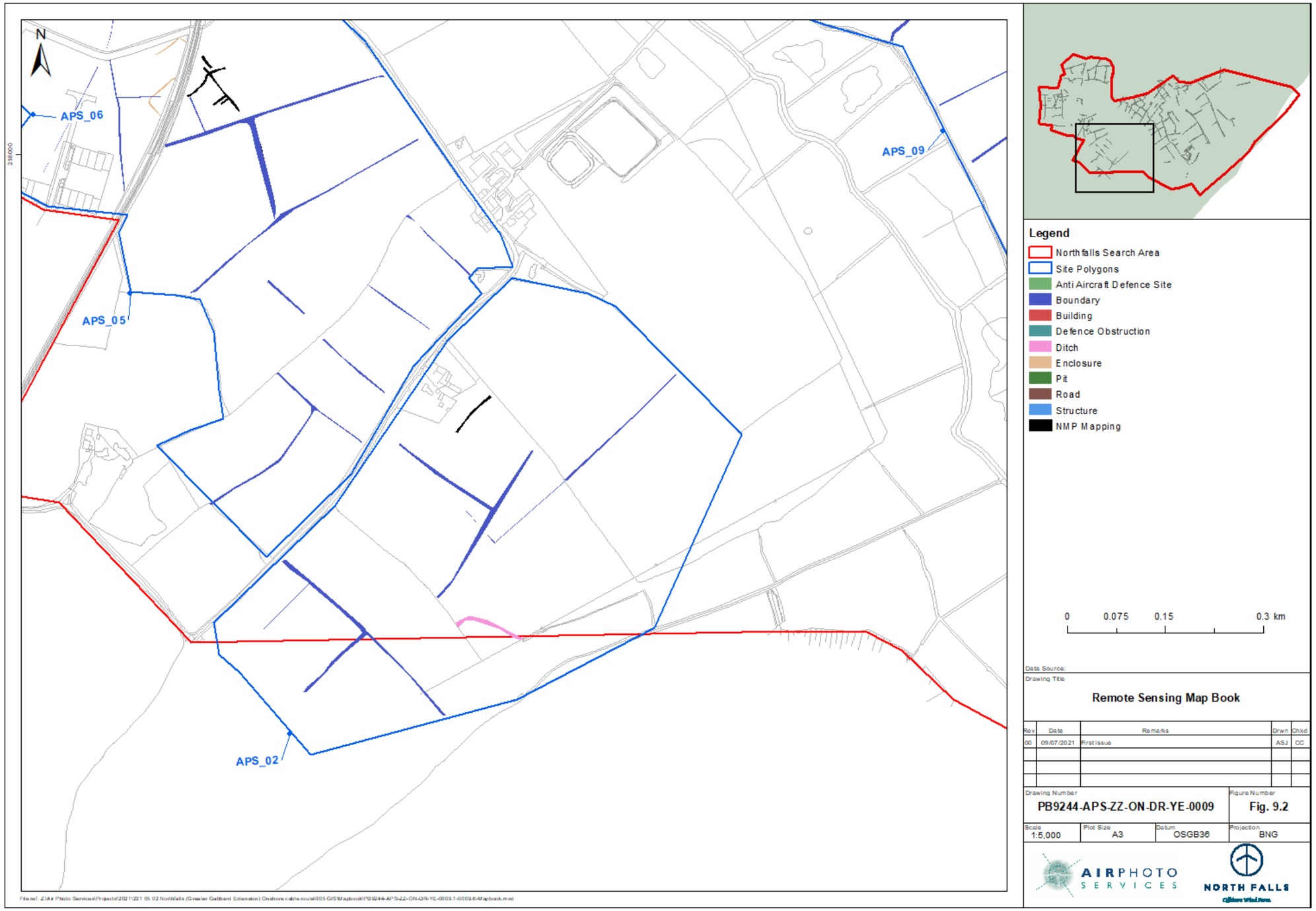
								visible however these could be natural and have been left unmapped. Features have been remapped and repositioned based on new georectified imagery			
APS_17	178	9.6	Round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10618	2977	Two ring ditches, possibly remains of round barrows, are visible as cropmarks on satellite imagery and oblique aerial photographs. Features have been remapped and repositioned based on new georectified imagery	618981	219044	TM 189 190
APS_18	178	9.6	Field system	Residual earthwork *via* LiDAR data	Medieval / Modern	MEX10618	2977	Area of former field boundaries visible as earthworks while extant and later as cropmarks in aerial photographs. Residual earthworks remain visible in Environment Agency LiDAR data. Area is heavily disturbed by geological cropmarks which may be masking archaeological features. There are also a large number of pits which remain unmapped as they may be natural. Areas of NMP have been remapped where possible for clarity and additions	619290	219200	TM 192 192
APS_19		9.6	Ring ditch	Levelled, cropmark	Possible prehistoric (Bronze Age)			Possible ring ditch visible as a cropmark on a single oblique aerial photograph. Area is heavily disturbed by geological cropmarks which makes this interpretation a possible feature but could be natural due to underlying geology	619208	219500	TM 192 195

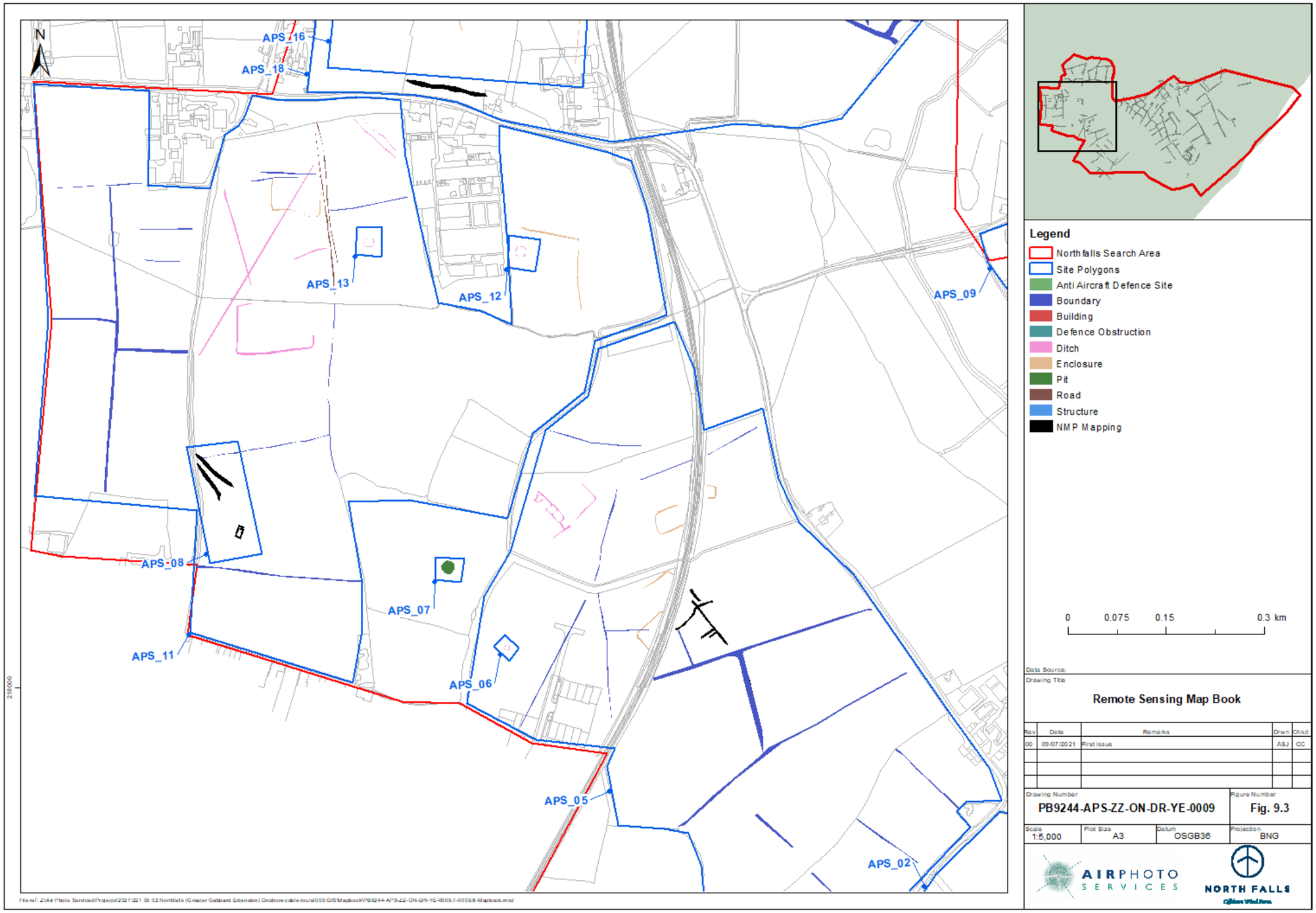
Figure 9 Index to the archaeology mapbook Figures 9.1 – 9.6



Figures 9.1 – 9.6 The archaeology mapbook







Legend

- Northfalls Search Area
- Site Polygons
- Anti Aircraft Defence Site
- Boundary
- Building
- Defence Obstruction
- Ditch
- Enclosure
- Pit
- Road
- Structure
- NMP Mapping

0 0.075 0.15 0.3 km

Data Source:

Drawing Title

Remote Sensing Map Book

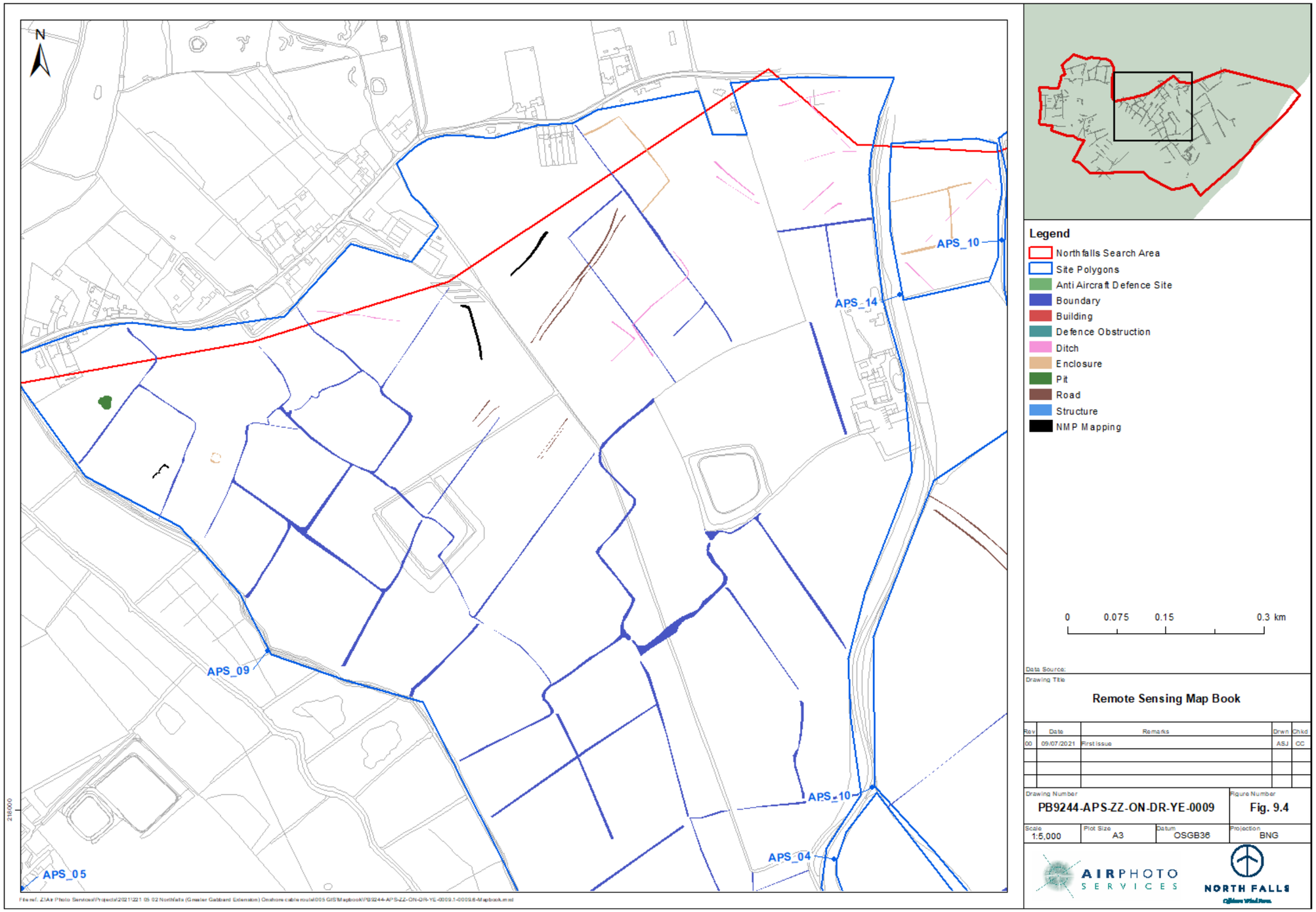
Rev	Date	Remarks	Drwn	Chkd
00	09/07/2021	First issue	ASJ	CC

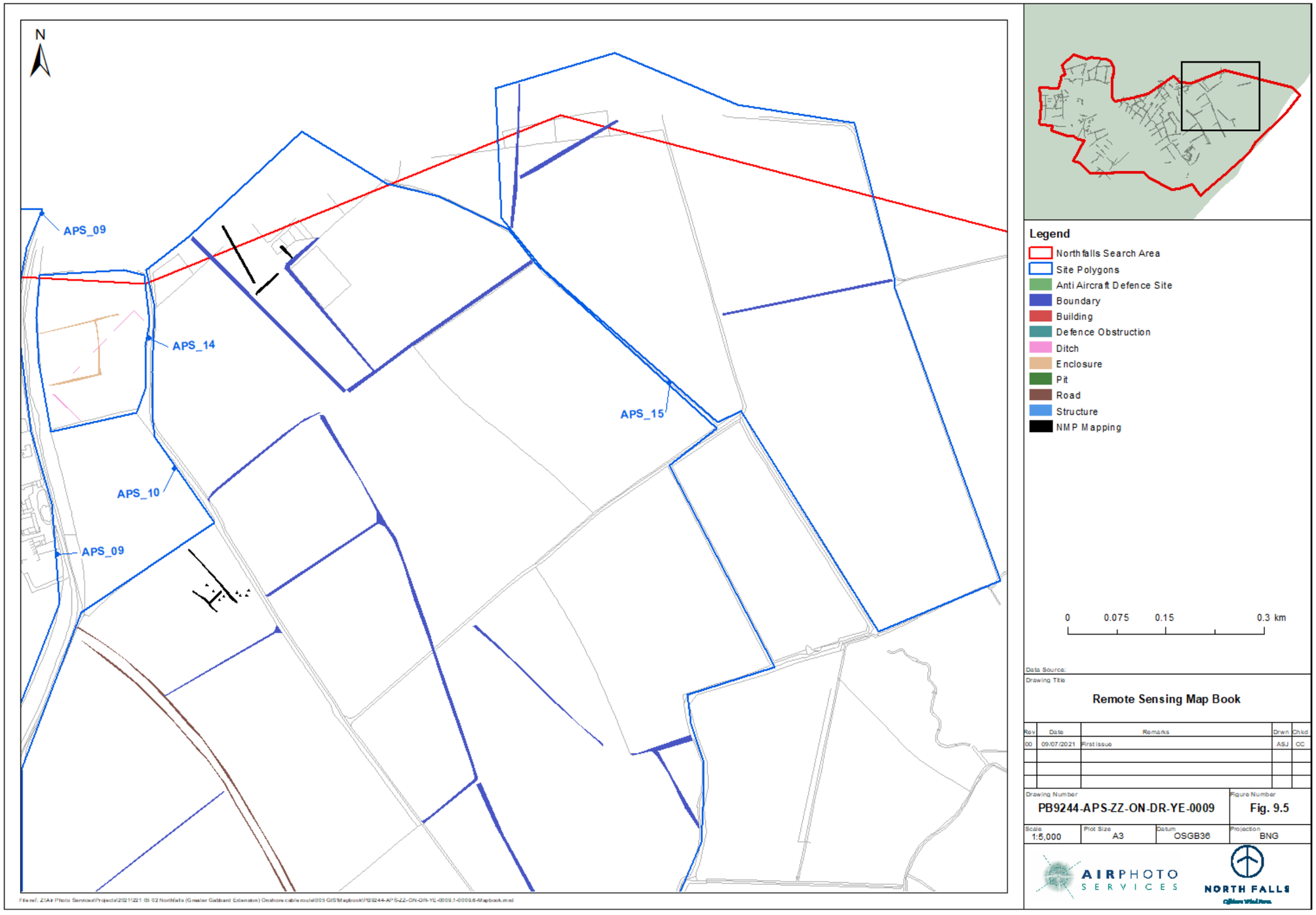
Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0009	Fig. 9.3

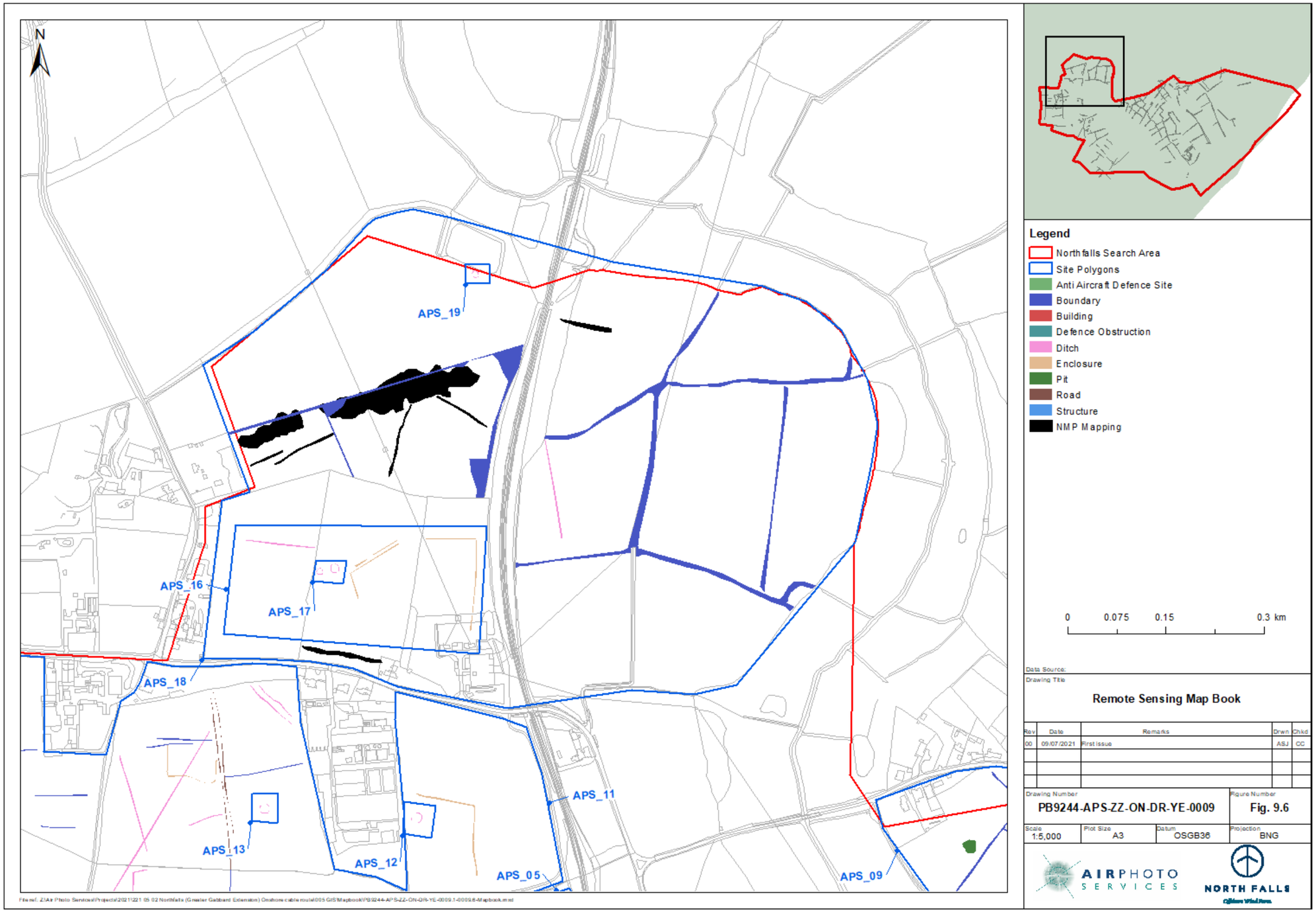
Scale	Plot Size	Datum	Projection
1:5,000	A3	OSGB36	BNG

AIRPHOTO SERVICES

NORTH FALLS







5.3 This assessment has recorded 19 individual sites or areas within the site. Some of these have been recorded previously by the NMP and the EHER. These previous interpretations have been noted and incorporated fully into the GIS database, where they are acknowledged and separated from the newly interpreted or augmented site interpretations made by APS.

5.4 The majority of the site to the west of the coastal marshes has been heavily ploughed and the majority of the cropmarked remains do not display any significant microtopography, as evidenced by examination of LiDAR data. There is however obvious potential for the discovery of sub-surface features and deposits in and around the visible foci of cropmarked enclosures, tracks, boundaries and ring ditches.

Prehistoric features

5.5 The search area contains evidence for Bronze Age funerary monuments knows as 'round barrows'. These were circular or sub circular mounds over either inhumation or cremation sites with a retaining ring ditch from which the mound was usually excavated. Ploughing and erosion reduces these mounds and flattens them, leaving evidence in the sub and topsoils for residual mounds and more frequently the retaining ring ditch which shows as a cropmark under appropriate environmental conditions.

5.6 **APS_06** is a cropmarked ring ditch which lies to the immediate north of Bursville Park which was mapped from specialist oblique aerial photographs. The ring ditch indicates the position of a former barrow, dated by EHER record MEX10628.

5.7 The EHER records a ring ditch, **APS_07**, again within the landscape recorded as EHER MEX10628, which showed as a cropmark on oblique aerial photos[7] 140m to the northwest of the likely eroded barrow at **AP_06**. Earlier vertical photos[8] taken in the 1940s however indicate an embanked depression at this site which maybe an extraction pit or pond. However, the interpretation has not been dated by any field

[7] TM 1918/2 308 310 (1976)
[8] RAF/106G/UK/1367 7130 and RAF/106G/UK/1673 3087 (1946)

investigation, and remains open to discussion. The feature was infilled and eroded between 1946 and 1976 and is of unknown date.

5.8 To the west of Cook's Green Farm, cropmarks visible on a single oblique aerial photo[9] indicate a ring ditch, likely to have been a round barrow, **APS_13** (MEX 10636). To the east of the Farm **APS_12** (MEX10636) records a further cropmarked ring ditch which was noted by the NMP as a likely round barrow, which was visible on multiple aerial photo sources[10].

5.9 At **APS_17** (MEX10618) two ring ditches which are likely eroded round barrows are visible as cropmarks on specialist obliques[11] and the 2005 and 2009 timeline images at Google Earth, to the east of Bond's Farm. These features are recorded by EHER as part of MEX10618.

5.10 A possible ring ditch, which is undated but likely to be a prehistoric feature, is visible as a cropmark on an oblique aerial photograph [12]at **APS_19**, to the north of Bond's Farm.

5.11 Site **APS_05** (EHER MEX10628 and 103171) encompasses three foci of fragmentary ditched enclosures and other ditches which may be outlying fields, to the north of Bursville Park and south of Bridge Cottages. These enclosures and ditches are pre-modern, and are likely to date to the Iron Age or Roman periods and are visible as cropmarks on specialist oblique images[13]. These features underlie a Post Medieval field system which has been partially removed and is discussed below.

5.12 **Site APS_09** (MEX10655 and 10609) is a similar site, where likely prehistoric remains of ditched enclosures, tracks and boundaries are visible alongside and predominately to the north of, a Post Medieval field system. The likely Iron Age – Roman features are visible between Lodge Farm, White Lodge and Dairy House Farm, where in places they

[9] TM 1819/1/275 (1974)
[10] TM 1819/1/275 (1974) and TM 1919/2 314 315 316 (1976)
[11] TM 1819/1 277 278 1974, TM 1919/1 302 303 1976, TM 1919/2 318 1976, TM 1819/2 165 166 167 168 1979, TM1819/4 174, TM 1919/3 149 (1979), SWBW24-8-2977
[12] TM 1919/2 318 (1976)
[13] TM 1918/2 306 307 308 (1976), TM 1919/2 314 1976, TM1917/3 163 164 (1979) EX/13/08 299 (2013)

are overlain by the remains of more modern post enclosure boundaries. The earlier cropmarked features lie within the northern sector of site **APS_09**, and are easily discernible as they adopt an entirely different alignment to that of the later partially-extant field systems.

5.13 The EHER, at MEX13203, notes 'a single large ring ditch with trackway running northeast to southwest, which was seen on 'AP, unknown, 1979' and 'AP NMR[14] 1976 TM2118/3/366, to the south of Great Holland. This feature is recorded to the south of **APS_14**, east of **APS_09** and to the north of **APS_10** (MEX10626)**,** where fragmentary undated, likely prehistoric, ditches and pits are visible as cropmarks beneath a cohesive landscape of Post Medieval field boundaries which have been removed, over some extremely complex natural environmental anomalies which also show as cropmarks.

5.14 MEX13203 is not included in the NMP mapping, or this present assessment of aerial imagery. Close examination of the obliques TM2118/3/365 and 366 show that this area also contains wide curvilinear and sinuous features which show as well defined cropmarks and are natural periglacial anomalies in the underlying glaciofluvial drift (gravel) substrate. This identification is likely to have been made in relation to the underlying natural environmental features. However, **APS_09**, and **10** and the wide areas over gravel substrate contains many pits and anomalies, some of which are mapped alongside ditches and overlying field boundaries within **AP_09** and **10** where there is a high likelihood of finding more buried heritage assets which date to the prehistoric or Roman periods than have been visible to date *via* cropmarks on aerial photographs.

Medieval and Post Medieval features

5.15 As noted above, cropmarked remains of earlier tracks, enclosures and likely associated field boundaries are visible beneath an overlying post-enclosure landscape. Many of the 'modern' boundaries which were set out when the land was enclosed following land enclosure legislation which was enacted between 1604 and 1914. These

[14] National Monuments Record, now known as the Historic England Archive.

boundaries are recorded on the Ecclesiastical Parish Tithe maps, the administrative Enclosure maps, and are depicted through the First Editions of the 1:10,560 and 1:2,500 OS mapping, which dates from the latter part of the 19th century through revisions into the mid-20th century. These boundaries overlie or are visible in the same general locations as the likely-prehistoric buried remains of small enclosures, settlement and funerary features.

5.16 They are visible as extant features on 1940s aerial photos, and subsequently as marks in crops and as microtopography on visualised LiDAR data across the central part of the site. They were systematically removed since the 1950s, to make way for modern agricultural regimes, and are easily differentiated from the underlying earlier fields and enclosures by their regular nature, the manner in which they 'fit' with the wider modern landscape and their depictions on former editions of the OS and the available Tithe mapping.

5.17 **APS_10** (MEX103161) includes an extensive area of Post Medieval field systems and the cropmarked remains of a former track or road, which was a former access directly to MEX1049134, a Medieval to Post Medieval landing-place on the Gunfleet estuary. This track and the nearby military 'K13 Diver' site **AP_03** were seen as extant features on 1950s vertical aerial photos[15] , have now been removed, and were situated in land to the east of Great Holland Lodge. Both now show as marks in crops and grass respectively. The track is depicted as an extant landscape feature on the 1st Edition OS 1:10560 map of 1880 (**Figure10.2**).

5.18 A square enclosure, which is dated to the Medieval period by the NMP and EHER, and some possibly associated ditches, were recorded at **APS_08** from specialist oblique aerial photographs[16]. These features are recorded as cropmarks to the north of Bursville Park at MEX 1031368.

[15] RAF/87/723/1366 133 (1953)
[16] TM 1818/11 118 1980, TM 1818/14 122 (1980)

5.19 A further square enclosure, which likely to underlie or be part of a Post Medieval field system, is visible as cropmarks on specialist oblique images[17] at **APS_14** to the south of Great Holland.

5.20 Additional areas of former Post Medieval removed field boundaries were recorded at **APS_02, 11, 15** and **18**. **APS_18** at Bond's Farm also contains some areas of former infilled extractive pits which now show as marks in crops.

5.21 There are no noted traces of Medieval fields observed from aerial imagery in the Site.

Modern sites

5.22 As noted above, the east coast of England was heavily defended, particularly during WWII, against invasion from the air and from the North Sea.

5.23 Defensive pillboxes (MEX31496 (within the sea wall), 31495 (base only), 31493 (destroyed) and 1034361 (destroyed) are recorded by the EHER at the coast, alongside a destroyed Diver Site, K14, a minefield (MEX49906), a former heavy anti-aircraft battery (MEX49905) and an anti-aircraft gun site 'C4 Clacton: Little Holland' (MEX49905) have been destroyed or damaged by coastal erosion along with the sites of 19th century Martello Towers G (MEX1039274) and H (MEX1039273) which are not recorded from aerial photographs.

5.24 Inland, **APS_03** is recorded from the air as extant features in the 1940s[18] and later as parch marks in grass[19] and slight micro-topographic features[20] over the Nissen hut bases, former pillboxes (MEX103436 at Beach Farm) and site of the adjacent heavy anti-aircraft battery at Diver Site K13 (MEX1031358) near Clacton Road, Great Holland.

5.25 **APS_01** records a series of pits which show as marks in crop or grass[21] on vertical aerial photos taken in 1953, to the east of Holland Bridge at MEX49906. This area is recorded as the site of WWII minefield number 45/40. The pits photographed in 1953

[17] TM 2018/2 355, TM 2018/5 23, TM 2118/3 365 (1976)
[18] RAF/106G/UK/1673 3090 3091 (1946)
[19] Google Earth timelines 2005, 2009
[20] 2010 1m EA LiDAR
[21] RAF/82/723/1366 0144 0212 (1953)

retain slight micro-topography which is recorded as uneven ground *via* visualised LiDAR data[22].

[22] 2010 1m EA Lidar, 2016 1m EA Lidar, 2018 1m NLP Lidar, 2020 1m EA Lidar

6. Aerial photograph and LiDAR survey conclusion

6.1 Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates.

6.2 Features dating to the prehistoric, Medieval, Post Medieval and Modern periods have been identified and mapped. Some of these features have been previously identified by the EHER and Essex NMP survey.

6.3 In some cases this assessment has augmented and added to these data from modern airborne and satellite imagery sources.

6.4 It is obvious that the below-ground archaeological deposits which cause the marks in crops and grass in this area are more extensive, both horizontally and vertically, than shown *via* the aerial imagery. Absence of cropmark evidence does not necessarily indicate an absence of archaeological deposits in apparently blank areas. This search area also contains extensive natural periglacial features which will further mask overlying archaeological deposits.

6.5 WWII defensive features have also been mapped from aerial photos.

6.6 The separation of dating into specific periods of prehistory and history can only be confirmed by ground-based or documentary analyses, but some dating evidence for sites within the Landfall search area has been proposed by the EHER and NMP and by observation of morphological characteristics of cropmarked sites.

6.7 From an aerial perspective, this landscape may be analysed in a 'living' manner as one which developed over time and contains many multi-period elements. These will be more deeply stratified and extensive below the ground than is apparent in the results of the survey. The remains visible as cropmarks are all likely to have been impacted by agricultural cultivation, to some degree, and retain minimal or no micro-topographic features visible on the ground surface.

6.8 The assessment leads into and has benefited from a concurrent study of historic maps, which detail the development of the landscape over the past two centuries. This map regression study is presented below.

7. Map regression analysis

7.1 An historic map regression study was undertaken concurrent with the aerial imagery and LiDAR analysis to provide understanding of the development of the modern landscape.

Aims and Objectives of the Map Regression Analysis

7.2 The aim of the map regression analysis was to collect appropriate and available historic maps, including, Tithe and Enclosure maps where present, in areas where Ecclesiastical Parishes levied Tithes, followed by OS 19th century First Edition (1880), subsequent 19th and 20th century revisions and modern cartographic sources.

7.3 The objective was to investigate and demonstrate any landscape changes within the site over the 18th, 19th, 20th and 21st centuries.

Cartographic Sources

18th century mapping, showing the landscape before enclosure

7.4 John Chapman and Peter André's map of Essex was surveyed at a scale of two inches to one mile, and published in 1777. John Chapman was a land surveyor from Suffolk who later came to work in London with Mrs Mary Ann Rocque, widow of the cartographer John Rocque. Chapman had previously been involved in producing county maps of Durham, Staffordshire and Nottinghamshire and died the year after his Essex map was published. Peter André was of Huguenot descent, like many others involved in county surveys. Chapman and André were proficient in surveys of large areas of land, and their Essex map is of exceptional accuracy and cartographic excellence.

7.5 It pre-dates the Board of Ordnance (later the Ordnance Survey) by almost 40 years, as one of a series of county maps published by private cartographers in the later 18th century. It was surveyed before Parliamentary Enclosure and the apportionment of land Tithes in this area. The map records landscape features which were to be changed and remodelled over the next five decades, as parts of the open land were better drained, enclosed and apportioned to tenants and private owners. It was the first map that accurately portrayed detail in the boundaries roads and villages within the wider

landscape, and allows analysis of contemporary landscape patterns such as areas of commons, woodlands and wetlands.

7.6 The map is presented in this report in its original form, with hachured contours below for information**.**

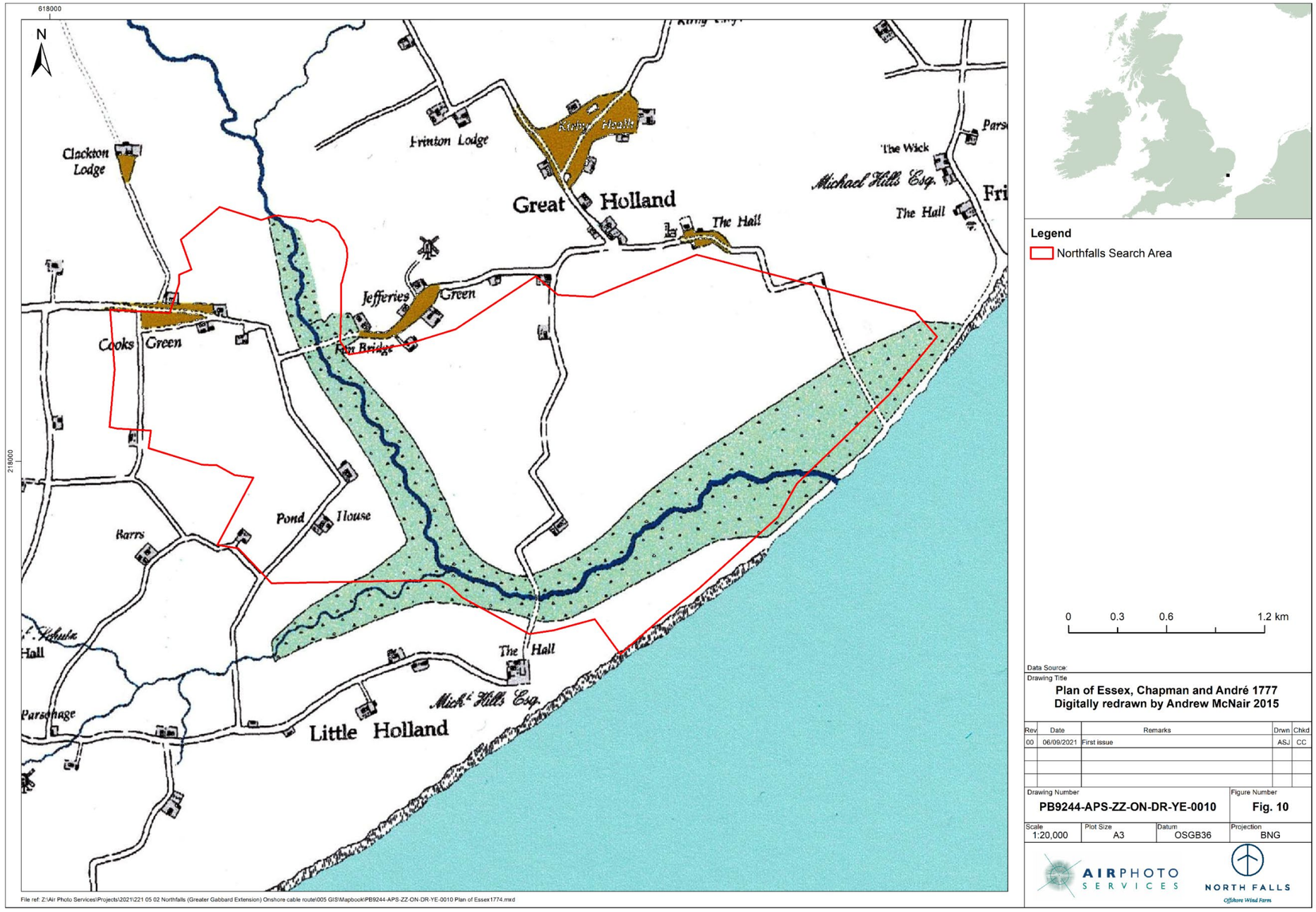
Chapman and André, 1777, presented digitally at **Figure 10**

7.7 It was digitally redrawn by Alastair MacNair in 2015 for clarity of interpretation, which is referenced at http://www.chapmanandremapofessex.co.uk/

7.8 This re-drawing is presented at **Figure 10**.

7.9 The map was originally published in 26 sheets, and further reprints were made in 1785 and 1833.

Figure 10 Chapman and André's map of Essex 1777, digitally redrawn by Alastair MacNair, 2015



7.10 In 1777, the roads between The Hall and Great Holland, Little Holland and Cooks Green, to Fen bridge and Jefferies Green and from The Hall at Great Holland to the coast were established. Farms at Pond House, Cooks Green and to the south of Great Holland.

7.11 The land around these roadways is depicted as open. The watercourse is clearly depicted along with an area of marsh to either side, and contouring shows the small drop in level to the watercourse on the original engraved version.

Tithe Maps

7.12 Tithe maps are a detailed survey of the rural landscape within ecclesiastical parish boundaries in force at the time of survey. Tithe apportionment documents show the landholders and tenants of areas subject to tithe. The primary function of the Tithe maps is to provide a graphic index or visual means of reference to the apportionments, for taxation purposes within each ecclesiastical parish. Each piece of land liable to tithes was depicted and given a plot number, unique within that parish, by which it could be identified in the apportionment. The maps are detailed, and present a dated surveyed record of the land.

7.13 The Great Holland (1839) **Figure 11** and Little Clacton (1840) **Figure 12** Tithe maps cover the site, and indicate a well bounded and established rural landscape which is reflected in the later surveys undertaken by the OS from 1880, in contrast to the open land depicted by Chapman and André some 63 years earlier.

Figure 11 Great Holland parish Tithe map 1839

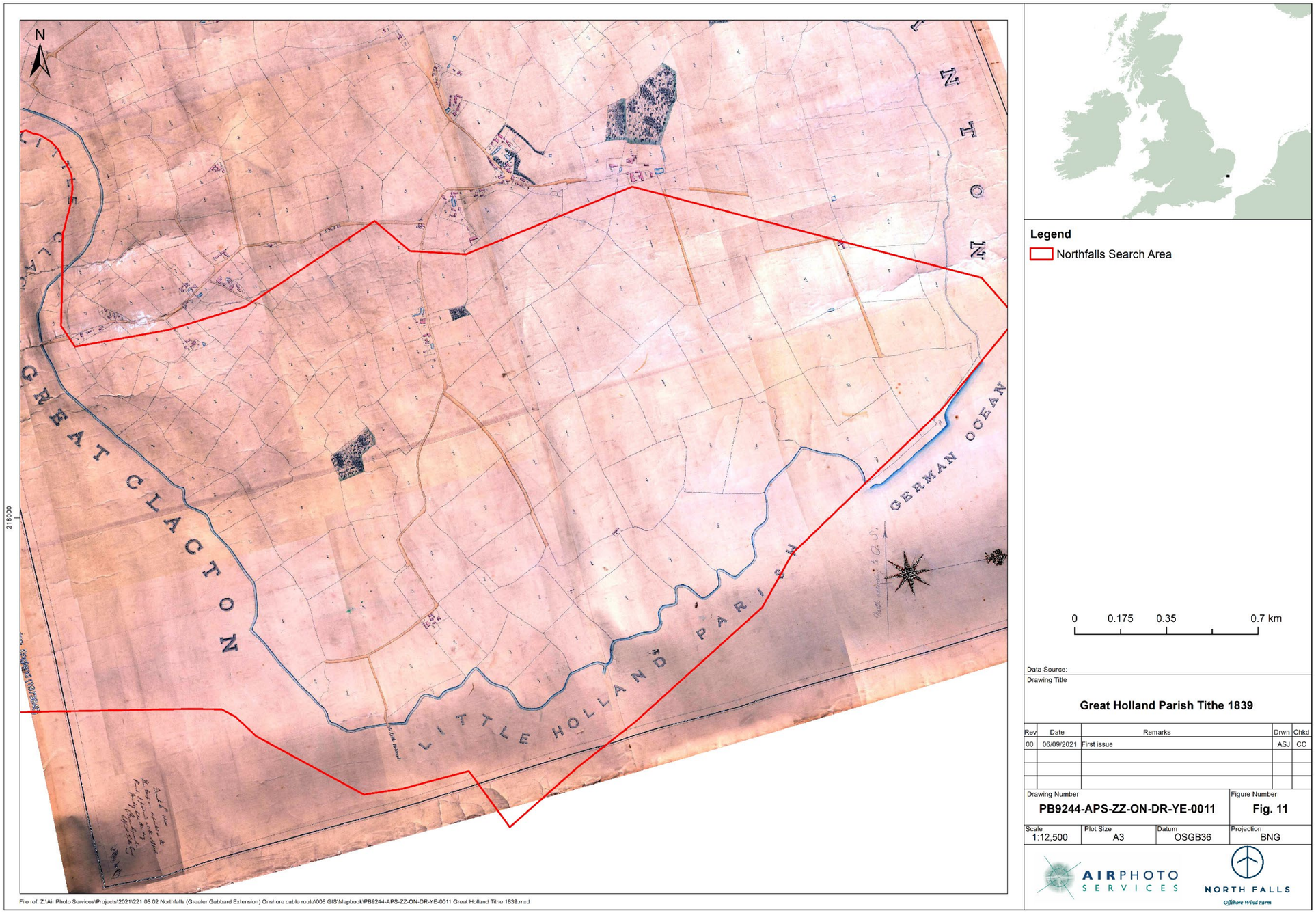
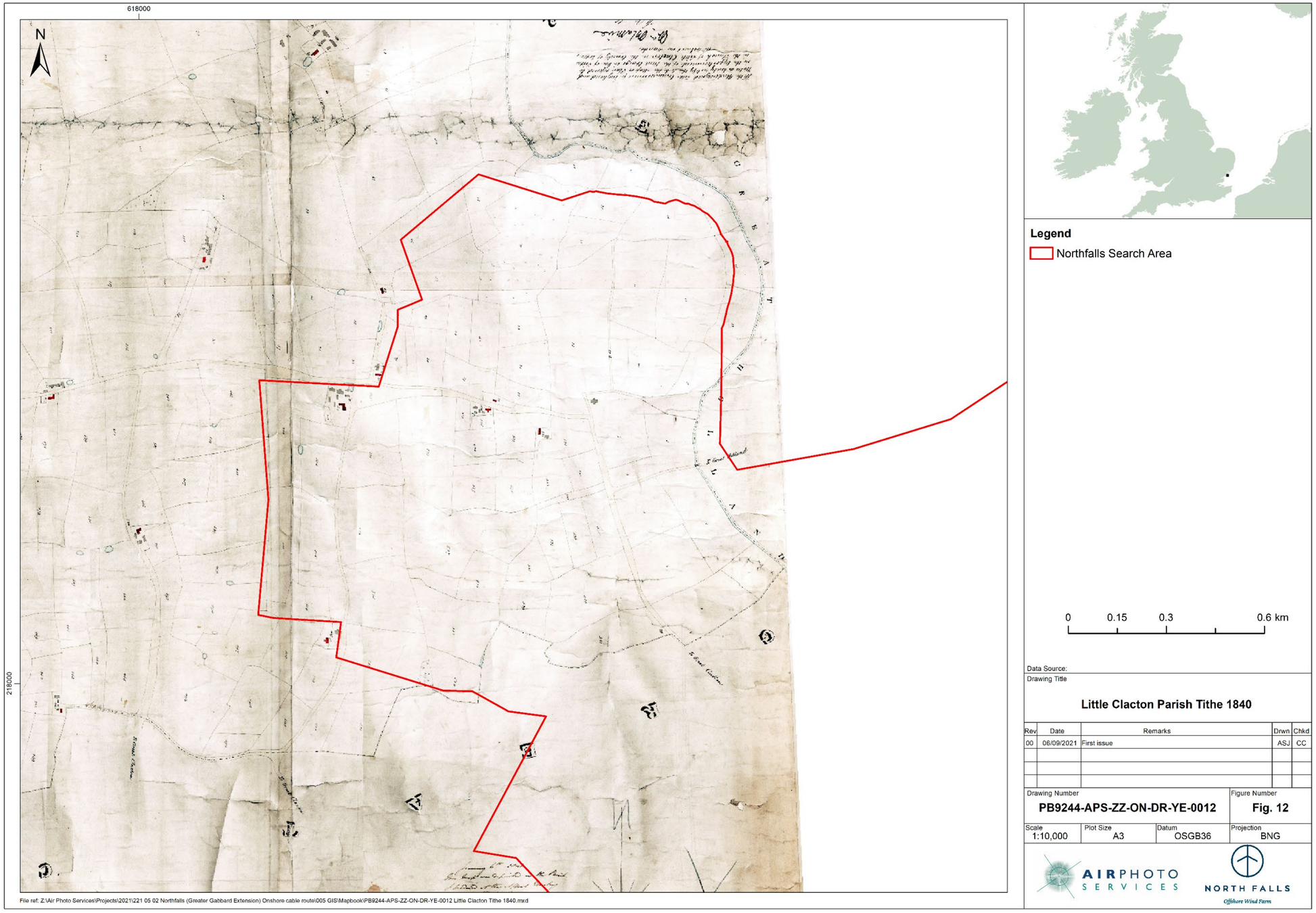


Figure 12 Little Clacton parish Tithe map, 1840



Enclosure awards

7.14 In the Post Medieval period, open fields lands and commons were enclosed and bounded in parts following the Enclosure bills enacted by Parliament between 1604 and 1914.

7.15 Enclosure describes various ways in which land was redistributed into designated units, usually consolidating small landholdings into larger farms. This included the conversion of commons, wasteland and open fields to formally enclosed units of land, the conversion of arable land to pasture and the partition of large areas of communally farmed land into small fields farmed and owned or tenanted by individuals.

7.16 In this area of Essex, only the enclosure one small area at Holland Green is archived, and this map presents no differing information to the Tithe maps which show the established boundaries comprehensively.

Historic Ordnance Survey Maps

7.17 From the mid-19th century, the OS surveyed, published then revised mapping from their first editions, which in this area were published in 1880, at 1:2,500 (the 'County series') and 1:10560 scale (Oliver, 2013).

7.18 **Figure 13** is a mapbook which contains sheets 1 – 11 **(Figures 13.1 – 13.11)** which present the OS mapping data and is presented at the end of this section. The landscape is shown at the following survey or revision dates:

OS County Series 1:10,560 scale

- **1880**
- **1898**
- **1925**
- **1938**
- **1958**
- **1967**

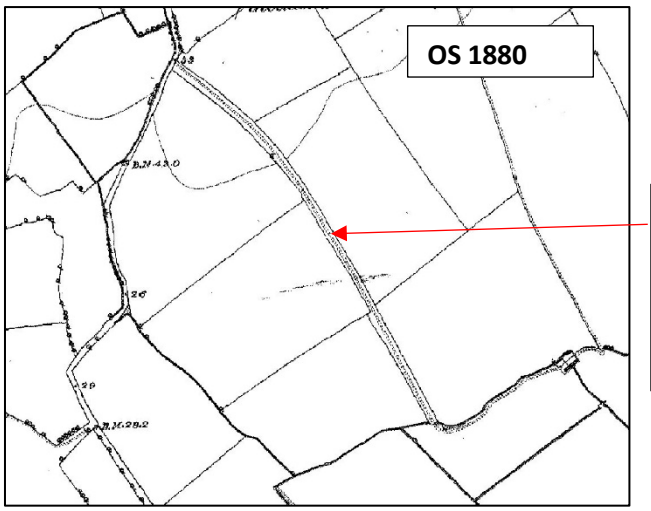
OS 1:10000 scale

- **1973**
- **1999**
- **2006**
- **2016**
- **2021**

1880

7.19 The 1880 First Edition 1:10,560 scale OS mapping records the landscape with all the extant field boundaries which were laid down at Enclosure and reflected within the Tithe mapping produced some 40 years earlier.

7.20 This map is shown at **Figure 13.1** and largely reflects the stable rural landscape of hedged fields and drains which prevails today, and is reflected in the cropmarked and relict remains of the boundaries which had been removed from the second half of the 20th century. The drains which flank Holland Brook are extant, as is the trackway which connects to the Gunfleet landing place (EHER MEX1049134) to its south. This trackway was later removed and is now visible as a well-defined curvilinear mark in crops, and is recorded as part of **APS-10** from aerial imagery.



1898

7.21 The 1880 mapping was revised in **1898** (**Figure 13.2**), when no material landscape changes are evident to the rural boundaries and coastal landscape, but the Clacton-on-Sea Branch of the Great Eastern Railway (GER) has been added to the mapping since 1880 and traverses the western sector of the Site from south to north.

1925 and 1938

7.22 Again, little change in the rural environment is reflected in the **1925** or **1938** revisions (**Figures 13.3 and 13.4**). By 1925, the golf links have been established alongside the coast to the east of Holland Gap.

7.23 The 1925 and 1938 maps also depict disused gun emplacements at Holland Gap and Chevaux de Frise Point. None of the earlier maps depict the Martello Towers at the coast, which are now destroyed and recorded within the EHER.

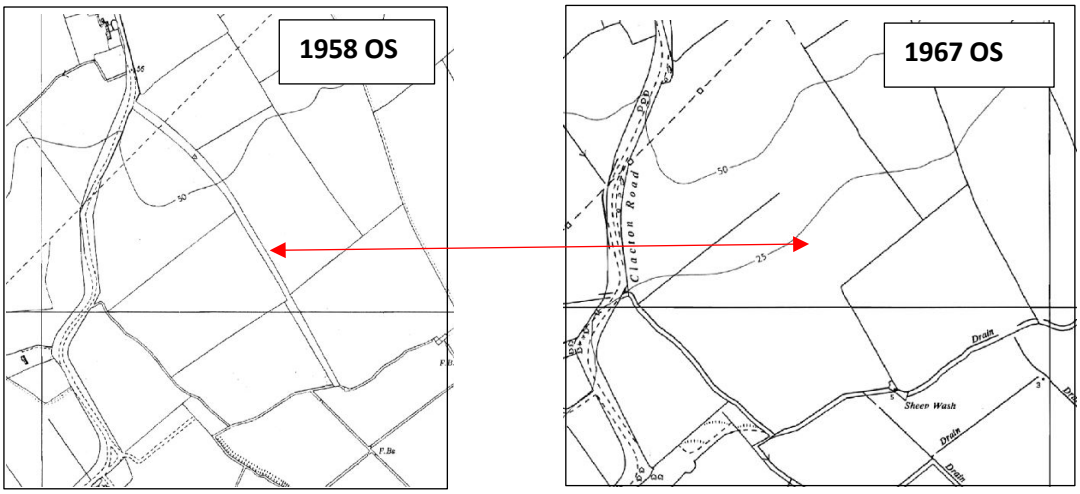
7.24 By **1938** the GER is re-labelled as the London Northeast Railway, (LNER).

1958

7.25 The **1958** OS map (**Figure 13.5**) shows that the post-WWII landscape remains the same, with no indication of any defensive features (beyond the pre-war gun emplacement sites on the coast), as is usual on non-military OS mapping in this area. The golf links are now renamed as Frinton Golf Course and housing development at Bursville Park to the north of Clacton is now present.

1967

7.26 The trackway which was mapped as a cropmark in **APS_10** may have been removed between **1958** and **1967**, as it and the Gunfleet landing space are not present on the **1967** (**Figure 13.6**) OS mapping, when a sheep wash is depicted at the southern end of the former track.



7.27 The trackway which was mapped as a cropmark in **APS_10** was altered or removed between 1958 and 1967, as it and the Gunfleet landing space are not present on the 1967 OS mapping. The feature is depicted, however, in 1973, when it is marked as a track with a dashed line (which leads directly to a sheep wash, which was also depicted in earlier years. Apart from minor changes, the rural landscape depicted by the OS changed little between 1880 and 1967.

1973

7.28 The difference between the **1973** 1:10000 scale map (**Figure 13.7**) and the 1967 map is marked, as large areas of small fields have been opened up and the boundaries removed by 1973. This change is reflected in the aerial imagery assessment, which records areas of removed boundaries which showed as cropmarks over their residual sub-surface buried ditches from the mid-1970s onwards. This loss of boundaries is evident between Clacton Road and the drains flanking Holland Brook. Further housing development is also evident at Holland-on-Sea.

1999

7.29 The **1999** digital 1:10000 scale coloured OS mapping (**Figure 13.8**) graphically indicates changes to the centre of the site between Wood Hall, Frinton Golf Course and Holland Brook, and south of Cook's Green, which is now largely open land where smaller fields were once bounded by hedges and ditches. The fields can be reconstructed and compared to the pre-1973 OS mapping *via* their appearance as extant features on pre-1970s aerial photos, and their cropmarked remains, which show on specialist oblique, post 1970s verticals and post-1999 digital images from airborne and satellite platforms. Their residual micro-topography in the form of slight banks and ditches is evident in some areas *via* visualised LiDAR data. The 1999 edition of the OS map also emphasises the hydrology of this drained coastal hinterland in its use of colour.

2006, 2016 and 2021

7.30 The **2006** coloured OS map (**Figure 13.9**) shows a very similar landscape, which continues through **2016** (**Figure 13.10**) to **2021** (**Figure 13.11**).

8. Map Regression Conclusion

8.1 The landscape within this Study Area is rural, and in the coastal hinterland has been under arable cultivation, with drained land and marshes flanking the coast and Holland Brook. The modern landscape boundaries were established during the 19th century.

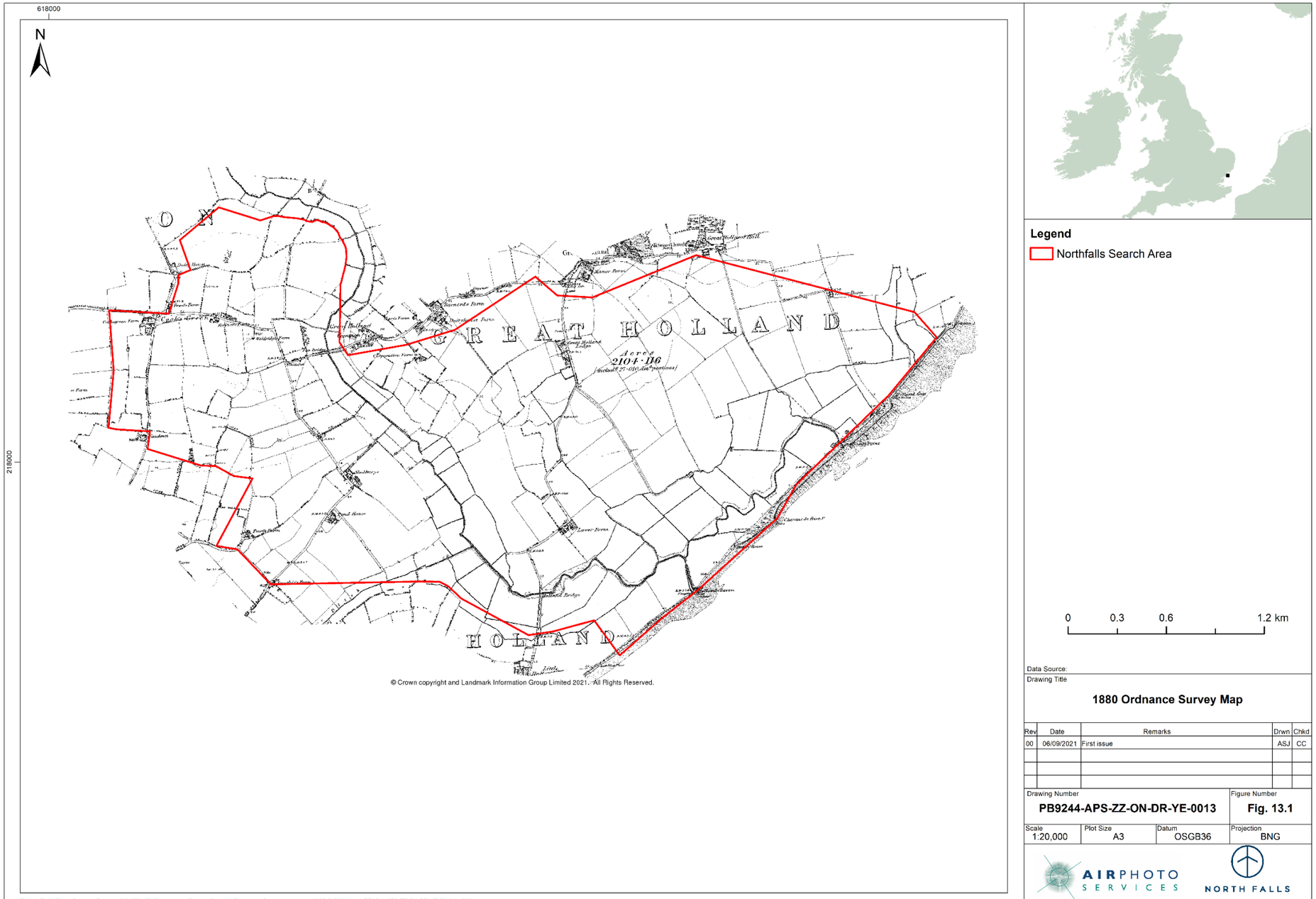
8.2 The GER (later LNER) Railway line was first evident on OS 1:10,560 mapping in 1898.

8.3 After 1967, the landscape began to open up with the removal of large areas of Post Enclosure field boundaries which changed the rural environment since it was established following land enclosure, making the way for modern mechanised agricultural cultivation methods.

8.4 The small hamlets, farms and settlements have been stably present and mapped since at least the 18th century and likely before, and the settlements at Bursville Park and Holland-on-Sea to the south of the area have developed since the 1960s.

8.5 The later coloured OS maps indicate the hydrological features graphically, showing the drainage and character of this coastal hinterland area.

Figure 13 sheets 1 – 11 OS map regression 1880 – 2021



Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1880 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	Fig. 13.1

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

AIR PHOTO SERVICES

NORTH FALLS Offshore Wind Farm

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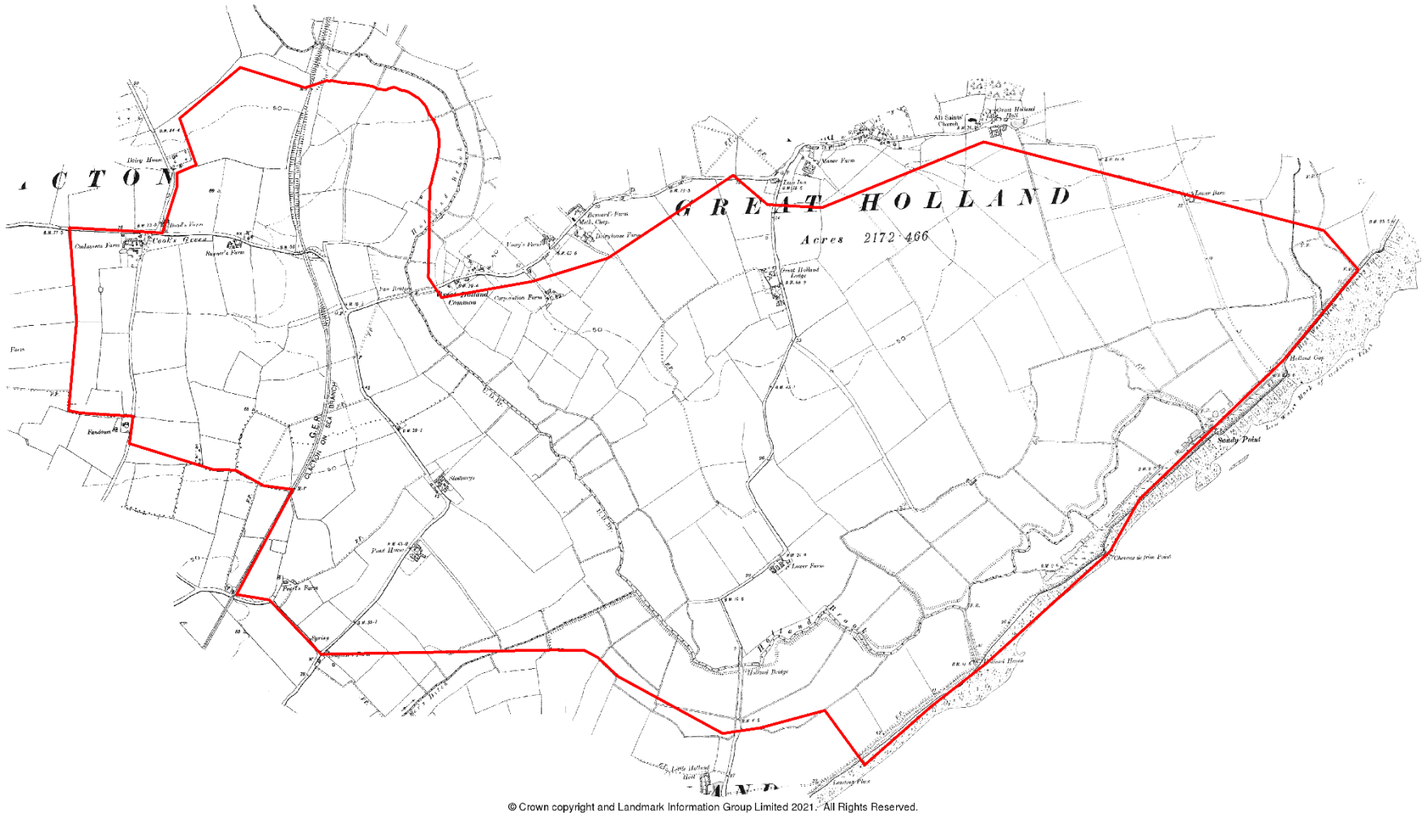

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Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1898 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.2**

Scale	Plot Size	Datum	Projection
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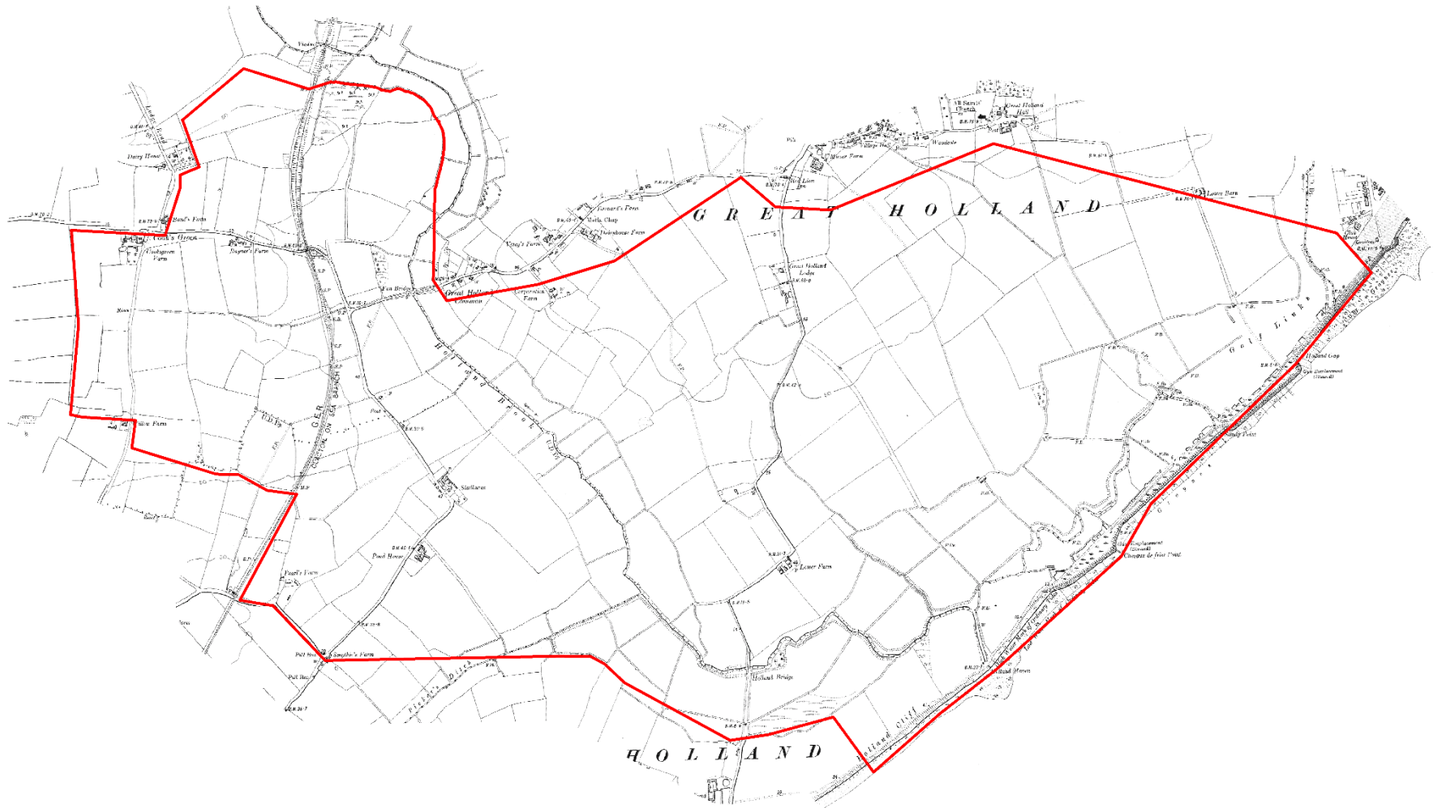

Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1925 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.3**

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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NORTH FALLS
Offshore Wind Farm

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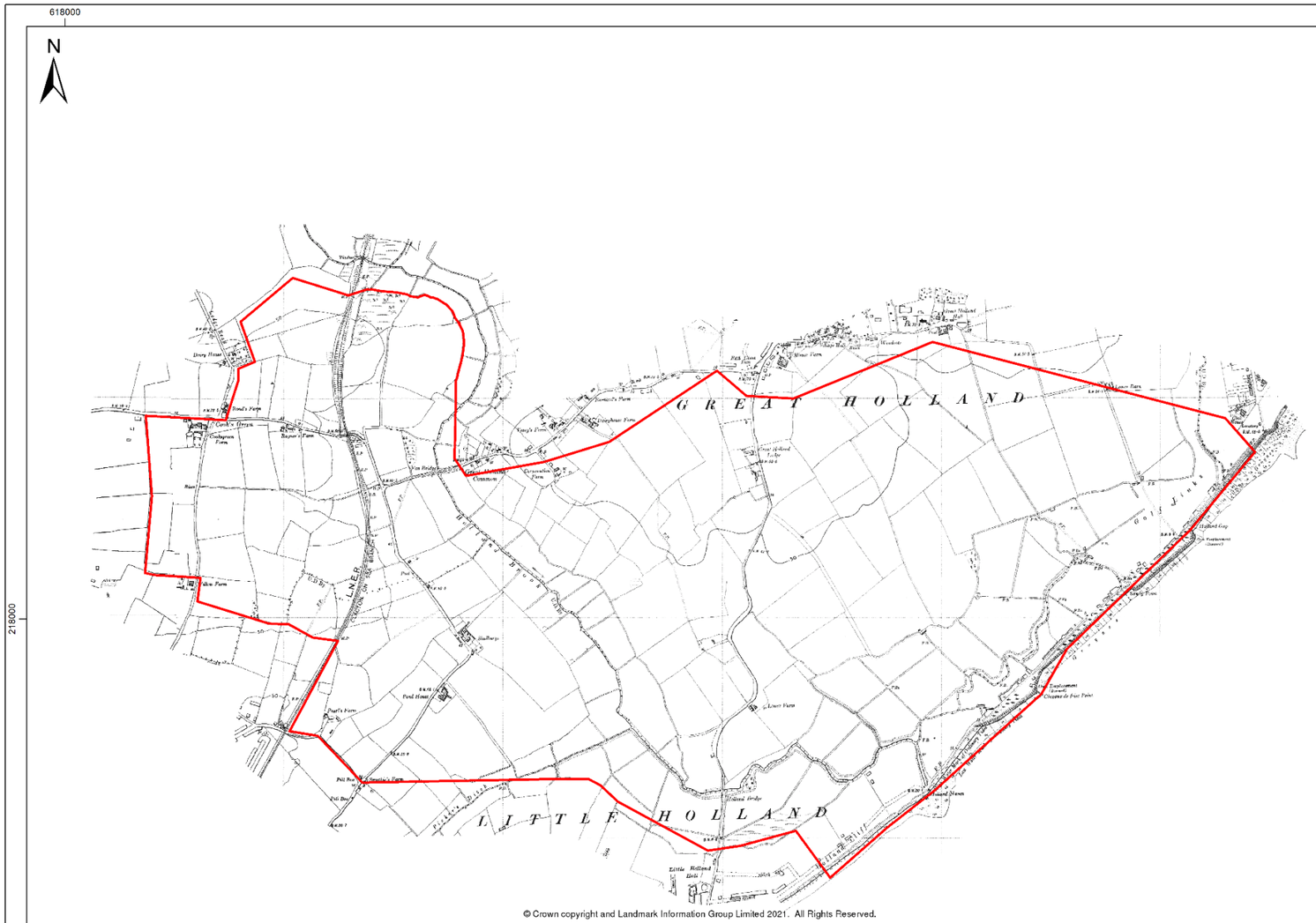

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Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1938 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.4**

Scale	Plot Size	Datum	Projection
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NORTH FALLS Offshore Wind Farm

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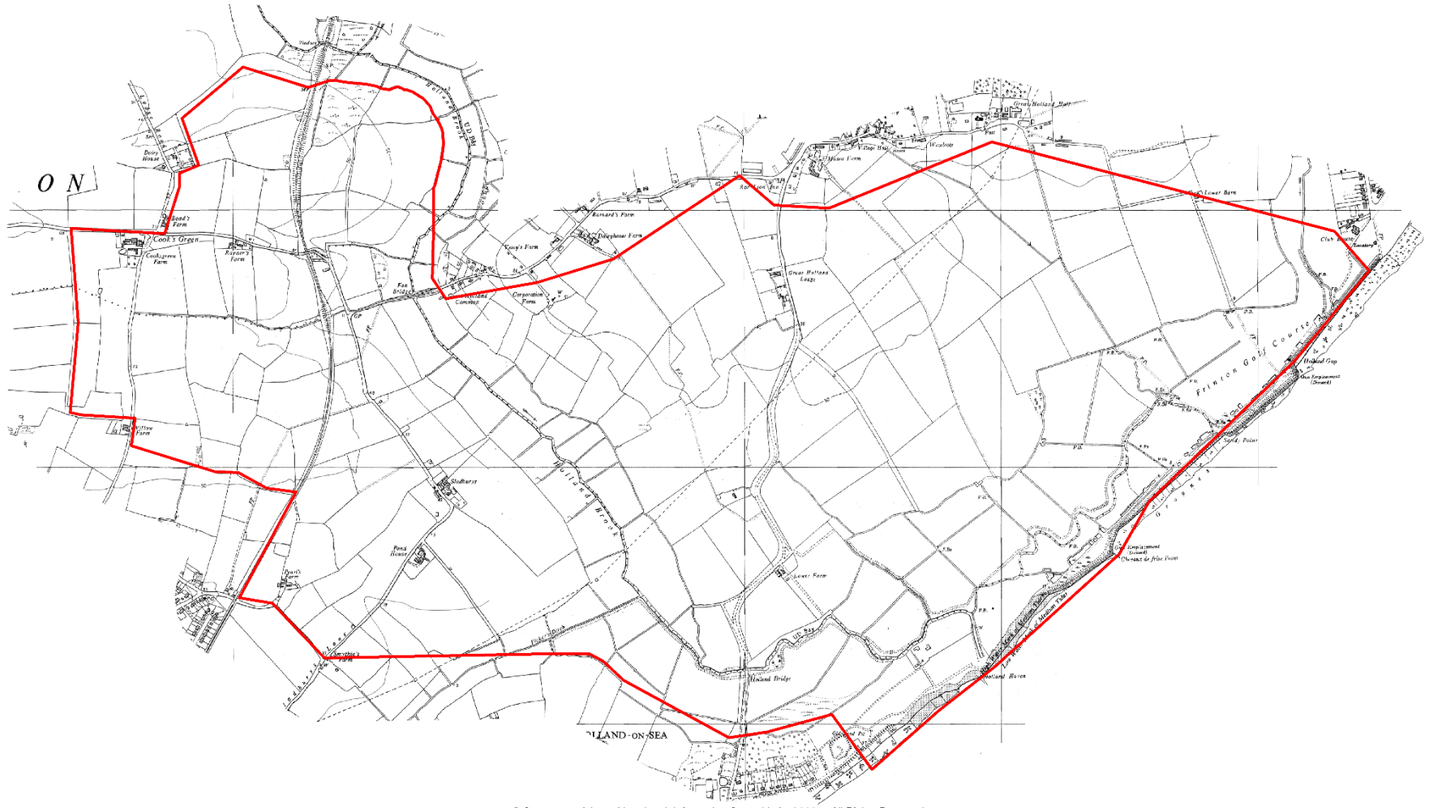

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Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1958 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.5**

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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Legend

Northfalls Search Area

Data Source:

Drawing Title

1967 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	Fig. 13.6

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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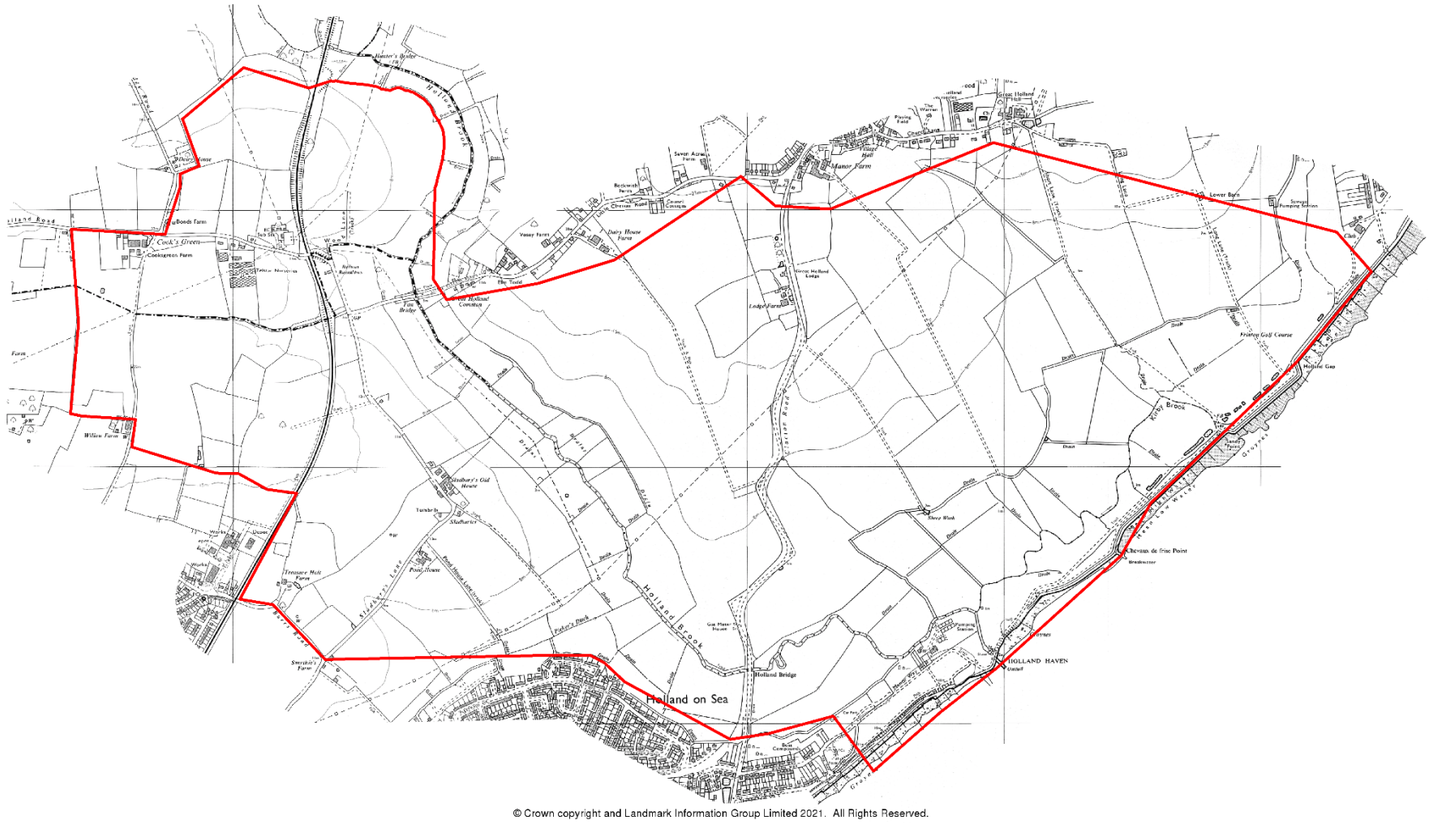

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Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1973 - 1976 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	Fig. 13.7

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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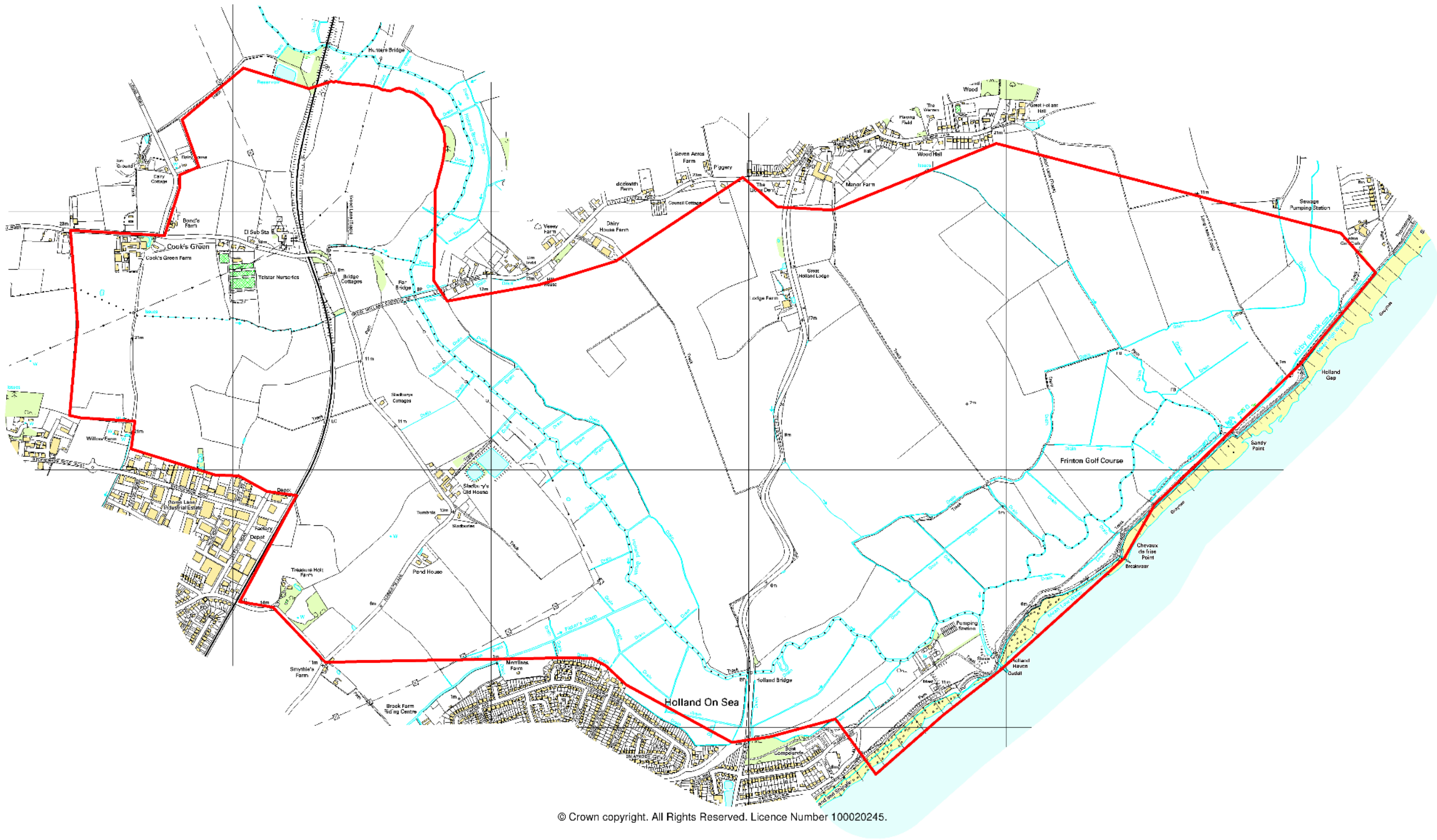

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Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

1999 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.8**

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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NORTH FALLS Offshore Wind Farm

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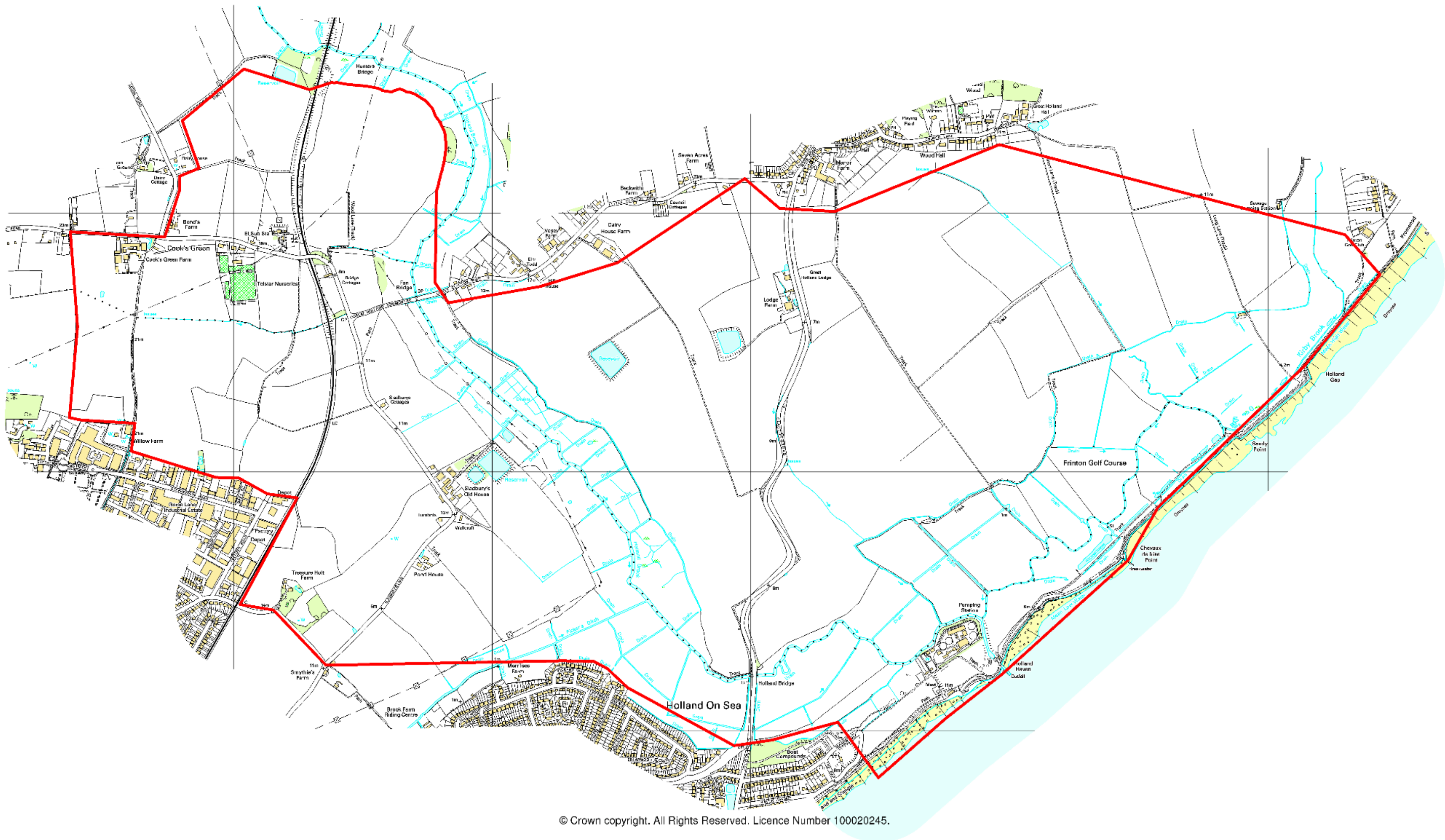

Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

2006 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.9**

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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Offshore Wind Farm

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618000

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218000

Holland On Sea

Frinton Golf Course

File ref: Z:\Air Photo Services\Projects\2021\221 05 02 Northfalls (Greater Gabbard Extension) Onshore cable route\005 GIS\Mapbook\PB9244-APS-ZZ-ON-DR-YE-0013.10-2016.mxd

Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

2016 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	Fig. 13.10

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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NORTH FALLS Offshore Wind Farm

File ref: Z:\Air Photo Services\Projects\2021\221 05 02 Northfalls (Greater Gabbard Extension) Onshore cable route\005 GIS\Mapbook\PB9244-APS-ZZ-ON-DR-YE-0013.11-2021.mxd

Legend

Northfalls Search Area

0 0.3 0.6 1.2 km

Data Source:

Drawing Title

2021 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	**Fig. 13.11**

Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG

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NORTH FALLS Offshore Wind Farm

9. Appendix Airborne remote sensing data sources, processing, interpretation, mapping methodology and limitations

Data Type and Sources

9.1. This survey has utilised a range of sources and archives in order to identify, interpret and map heritage features from the air and from satellites. This section gives details about the methodology employed to search each archive, the type of data available for study and the interpretation methods applied to each data set.

Online Aerial and Satellite-Derived Images

9.2. Since 1999, digital mosaics of multiple timelines of georeferenced aerial photographs have been uploaded to geoportals such as Google Earth and at Bing.com. The dates attributed to these images are not 100% assured or authenticated, but for heritage survey purposes this has no legal implication in this instance. They are available in real time as open-source imagery online, with some copyright requirements. The imagery may change when new sources are uploaded.

9.3. All available online aerial and satellite derived images which constitute the open-source mosaics of aerial imagery displayed on Google Earth and Bing.com/Maps (aerial and birds-eye if available) were consulted for this survey. All timelines available on these geoportals were systematically consulted, between 1st and 30th June 2021.

9.4. Following magnification, relevant images were captured at the highest resolution using the 'save-image' function in Google Earth Pro or a screen snipping tool. They were saved, labelled and filed for geo-referencing.

9.5. Summer timelines at Google Earth were very helpful in the recording of cropmarked buried sites.

9.6. Aerial images displayed at Bing Maps was used in the same manner but with the limitations that there was a restricted single view timeline and less flexible image capture mechanisms. The Microsoft 'snipping tool' was used to capture the relevant images which generally were not as informative as the comprehensive timeline datasets at Google Earth

Aerial photographs held at the Historic England Archive

9.7. Paper based copies of all vertical, military oblique and specialist oblique aerial photos held under enquiry number 128957 were examined in detail in the Historic England Public Search Room, by Adam Jarvis in June 2021. Relevant photographs were recorded using a high resolution digital camera, filed and selected images georeferenced for the project archive. A map showing the Historic England aerial photograph coverage is presented at **Figure 2**. The Historic England Archive could only arrange access to the 1940s – 1960s verticals due to CV19 restrictions.

Aerial photographs held at The Cambridge University collection of Aerial photographs (CUCAP)

9.8. The CUCAP collection was fully consulted by the Essex NMP. The collection is closed for digitisation, but a coversearch was obtained online at https://www.cambridgeairphotos.com/map/. A map showing the CUCAP aerial photograph coverage is presented at **Figure 3**.

Aerial photographs held at Essex Council

9.9. Digital images were supplied by Essex Council and were processed received from Helen Saunders and georeferenced as needed for interpretation. A map showing the Essex Council aerial photograph coverage is presented at **Figure 4**.

Essex NMP Data

9.10. Essex NMP data were supplied in GIS-ready shapefiles, which were derived from scanning individual drawn OS quarter sheet overlays depicting the NMP data. These data were integrated into this report as separate shapefile layers to maintain the integrity and acknowledgement of the source of these data. They were updated and all features re-digitised to bring them into line with modern recording standards where appropriate. The data covered the site fully, and were derived from the Tendring Enhancement NMP project for this area.

Environment Agency LiDAR Data

9.11. The Environment Agency has collected LiDAR data from airborne survey platforms in recent years at varying resolutions, which are available for downloading, processing, visualising and interpreting *via* the EA website https://environment.data.gov.uk/DefraDataDownload/?Mode=Survey (Environment Agency, 2020).

9.12. LiDAR data indicate variation in the height of the ground surface. Data is collected by an active laser beam fired in pulses which scans the ground surface. The reflected pulses are recorded by the sensor on board a geolocated airborne survey platform, fitted with an inertial measurement unit to record the roll, pitch and yaw of the aircraft.

9.13. The point cloud data derived from the survey are processed into a series of Digital Elevation Models (DEM) usually in American Standard Code for Information Interchange (ASCII) format. These include Digital Surface Models (DSM) which contain tree cover and buildings, and Digital Terrain Models (DTM) which remove tree cover and can reveal features beneath the tree canopy (Bennett *et al* 2012; Hesse 2010; Štular *et al* 2012, Historic England, 2018).

9.14. These data are of assistance in recording micro and macro topographic features which may indicate relict or extant archaeological features and historic landscapes alongside more modern features. LiDAR data are best interpreted and used in conjunction with modern and historic aerial photographs and maps to provide ground truth information for features and sites recorded *via* this prospection method.

9.15. The data needed were identified by using the EA timestamp shapefile detailing the LiDAR file names within the area of interest and the OS 10km and 5km grid square to identify the grids and quarter sheets. Digital Terrain Models were selected as the primary data source as the ability to remove the vegetation cover makes it ideal for prospection. All available LiDAR data for this site were downloaded for completeness of evidence. The metadata for the LiDAR downloaded for this assessment can be seen at **Table 2.**

9.16. The whole study area was covered by NLP LiDAR data at 1m resolution with other data available in individual survey areas.

9.17. A map detailing the LiDAR data coverage is presented at **Figure 6.**

9.18. The data were visualised into Hillshade, Multi Directional Hillshade, Sky View Factor, Open Positive and Open Negative using the Relief Visualisation Toolbox (RVT) Version 2.2.1. These visualisations were chosen as they are of most use for archaeological prospection. The multiple ASCII tiles were merged before being

visualised for ease of use in the GIS. The data were analysed alongside the aerial photographs and base mapping to double check the topography and nature of features interpreted from LiDAR data.

9.19. An additional visualisation was created using a simplified process based upon the methodology proposed by Hesse to create a Simple Local Relief Model (SLRM) (Hesse, 2010). A low pass filter was applied to nearest neighbour resampling, and the resampled model was removed from the original DTM, creating a Local Relief Model. This was then processed through the RVT with a smoothing factor of 20m.

Table 3: LiDAR tiles processed

Tile Name	Resolution (m)	Date Captured
TM1515	1	11/02/2018
TM1816	1	22/10/2018
TM1816	1	02/12/2017
TM1816	1	26/11/2010
TM1816	1	03/10/2016
TM1816	2	30/04/1999
TM1816NE	0.25	23/04/2009
TM1816NW	0.25	23/04/2009
TM1817NE	0.25	23/04/2009
TM1817NW	0.25	23/04/2009
TM1817SE	0.25	23/04/2009
TM1817SW	0.25	23/04/2009
TM1818	1	19/11/2016
TM1818	1	26/11/2010
TM1818	1	03/10/2016
TM1818	2	30/04/1999
TM1818NE	0.25	23/04/2009
TM1818NW	0.25	23/04/2009
TM1818SE	0.25	23/04/2009
TM1818SW	0.25	23/04/2009
TM1819NE	0.25	23/04/2009
TM1819NW	0.25	23/04/2009
TM1819SE	0.25	23/04/2009
TM1819SW	0.25	23/04/2009
TM1916NE	0.25	23/04/2009
TM1916NW	0.25	23/04/2009
TM1917NE	0.25	23/04/2009

TM1917NW	0.25	23/04/2009
TM1917SE	0.25	23/04/2009
TM1917SW	0.25	23/04/2009
TM1918NE	0.25	23/04/2009
TM1918NW	0.25	23/04/2009
TM1918SE	0.25	23/04/2009
TM1918SW	0.25	23/04/2009
TM1919NE	0.25	23/04/2009
TM1919NW	0.25	23/04/2009
TM1919SE	0.25	23/04/2009
TM1919SW	0.25	23/04/2009
TM2015	1	11/02/2018
TM2016	1	22/10/2018
TM2016	1	03/10/2016
TM2016	1	02/12/2017
TM2016	1	26/11/2010
TM2016NE	0.25	23/06/2008
TM2016NW	0.25	23/04/2009
TM2017NW	0.25	23/04/2009
TM2017SW	0.25	23/04/2009
TM2018	1	03/10/2016
TM2018	1	19/11/2016
TM2018	1	26/11/2010
TM2018NW	0.25	23/04/2009
TM2018SW	0.25	23/04/2009
TM2019NW	0.25	23/04/2009
TM2019SW	0.25	23/04/2009
TM2116NE	0.25	23/06/2008
TM2116NW	0.25	23/06/2008
TM2117NE	0.25	23/06/2008
TM2117SE	0.25	23/06/2008
TM2117SW	0.25	23/06/2008
TM2216	1	02/12/2017
TM2216	1	22/10/2018
TM2216	1	03/10/2016
TM2216	1	26/11/2010
TM2216NW	0.25	23/06/2008
TM2217NE	0.25	23/06/2008
TM2217NW	0.25	23/06/2008
TM2217SE	0.25	23/06/2008
TM2217SW	0.25	23/06/2008
TM2218	1	02/12/2017
TM2218	1	03/10/2016

TM2218	1	26/11/2010
TM2218NE	0.25	23/06/2008
TM2218SE	0.25	23/06/2008
TM2218SW	0.25	23/06/2008
TM2318NE	0.25	23/06/2008
TM2318NW	0.25	23/06/2008
TM2318SW	0.25	23/06/2008
TM2319SE	0.25	23/06/2008
TM2319SW	0.25	23/06/2008

Data Processing

9.20. The collected digitised photographs and images were labelled and archived and selected frames were georectified to the OS digital map base with the QGIS and ArcGIS georectification tools for interpretation and mapping. The project used an OSGB/1936 British National Grid European Petroleum Survey Group (EPSG):27700 Coordinate Reference System (CRS).

9.21. Interpretative or source queries were addressed as appropriate by further reference to the archived photographs in the survey files.

9.22. Following comparison to other airborne sources and all EHER data, extent of area polygons were digitised around the interpreted extent of features identified, and a site database created in QGIS as an attribute table within a shapefile.

9.23. When all data sources had been examined, interpretative polygons were digitised to further shapefiles to indicate the form, extent and type of extant features within areas.

Data Presentation

9.24. The data were presented in shapefile data format within the project GIS. A shapefile contains geographical reference data as individual objects such as a ditch, a bank, a structure or a coordinate area. Features exist as 'objects' and their 'attributes' where the interpretations are recorded within the shapefile.

9.25. In addition to the shapefile, the data derived from the survey are presented in the Technical Mapbook sheets 01 - 06 which is indexed at **Figure 10.**

9.26. The map book presents keyed, labelled and individually numbered illustrations at a consistent scale.

9.27. The data are also presented as a gazetteer of sites at **Table 1.** The gazetteer is derived from selected attributes within the extent of area mapping shapefile. It summarises the location, type, condition and interpretation of each individually identified site or area of features.

Interpretative Mapping

Extent of Area Mapping

9.28. Extent of area mapping was undertaken initially to identify archaeological assets through 'APS Site Polygons'. These polygons indicate the extent of area around a feature or group of archaeological features. A detailed supporting attribute table was compiled at this stage detailing the following for each feature:

- APS Site Number;
- Asset Type;
- Broad Type;
- NMP coverage;
- APS derived records;
- Evidence Type (1-10);
- Source (1-10);
- Period;
- Monument UID Number;
- Source HER;
- Comment;
- Geological Disturbance;
- NMP Additions/Remapping;
- By;
- Supplier;
- Client;
- Project;

- Easting;
- Northing;
- National Grid Reference;
- Map Source; and
- Map Book Number.

9.29. This process created a database which forms the basis for all detailed mapping and analysis.

9.30. Aerial imagery and LiDAR analysis is a non-intrusive survey method, and not all features which are identified may be accurately dated by this means alone.

Assumptions and Limitations

Historic Aerial Photographs

9.31. The assumption that aerial photographic survey and vertical and oblique aerial photographs show all features and will reveal a complete archaeological record in any given area is erroneous. This is due to many interactive survey, seasonal, environmental, meteorological and perception and interpretation issues which are set out below.

9.32. Interpretation of aerial photographs relies either on visual identification of the effect heritage assets have on crops and other vegetation, marks in soils or visible features or earthworks which are more visible at times of clear low light.

9.33. It is important to note that aerial photographs usually only show part of the horizontal and vertical extent of buried and upstanding features. Their capacity to reveal features as cropmarks, vegetation marks, soil marks or as the shadows cast by banks, ditches and walls, depends upon several environmental and agricultural factors prevalent at the time of the photographic survey. It is possible for many years' photography over one site to show nothing at all, and then during one instance of survey to reveal complex buried cropmark features. The direction of light at the time of photography, with reference to shadows cast and crop or soil marked features highlighted, can also affect the visibility of features on aerial photographs. Unlike digitally processed LiDAR and other data, the azimuth of the sun cannot be changed on a conventional aerial photograph.

9.34. Past and present land use also presents limitations to visibility of features. A cropped arable regime of cereals often allows the formation of cropmarks, whereas grassland, unless seen in times of extreme moisture stress, can mask the appearance of buried features. The time of year is thus important in gaining maximum benefit from aerial photographic sorties. In winter, the low leaf index and lower light angle assists visibility of topographic and earthwork features. In summer, ripening crops, often from April through to harvest in July/August, may show differential marks over buried features. Dry conditions will often cause parching in grass, which will then reveal areas of former foundations as the grass dies over the harder less moisture retentive buried features. Following harvest, weathering and ploughing, marks in soil often show where buried archaeological deposits are being actively ploughed and brought to the surface.

9.35. In this area of Essex, away from the marine-alluviated coast, the arable areas have been intensively eroded by ploughing. The areas of lighter shallow soils over well drained substrates are conducive to the formation of cropmarks over both buried heritage assets and complex and extensive geological anomalies in the substrates.

9.36. In constructing a comprehensive interpretation of the archaeological landscape, it is essential to examine a range of photographs, taken under a variety of environmental conditions, as has been done int his case.

9.37. The aerial photographs taken in the 1940s often recorded extant landscapes which have been altered or carry evidence for pre-modern fields and extant military features, particularly in coastal areas. These historic photos provide a starting point for the assessment of landscape change, in conjunction with the study of historic maps and modern aerial and satellite-derived imagery.

9.38. The remit of past oblique aerial surveys, the survey areas chosen and the visibility of sites to the aerial archaeologist can often determine the content and coverage of oblique aerial photography. Observer led flights may be heavily biased and may miss features which were present but were not seen or recorded. This area has been surveyed carefully by aerial archaeologists and subject to past mapping by the NMP, but some additions and clarifications to former mapping and interpretations have been made as expected.

9.39. It is also important to note that the perception of the environment and expectation of what is to be found may often limit the air photo analyst's mental 'openness' to features. This perception factor is mitigated by repeated examination of imagery taken in different years and under different conditions, and by teamwork between two or more interpreters checking the data. 'Photo fatigue' is also a factor in drop-off rates of discovery or perception of features. It is mitigated by alternating activities and personnel, checking interpretations with other team members and taking adequate visual breaks.

Online aerial photographs and satellite-derived images

9.40. Google Earth regularly uploads new images and attributes some images with the name of the provider and a date of capture. These dates are not verified, but for archaeological survey this is not a legally essential element of the metadata. The issue with data derived from geoportals such as Google Earth is that it changes and is added to; it is a dynamic collection of varied mosaiced dated images and varied resolutions of data derived from aerial photography and satellite imagery. During 2017-2018, Google began to capture its own data, and these layers are largely 'unattributed' in terms of provider. The main UK providers to Google Earth include Getmapping, Infoterra and Bluesky, The GeoInformation Group (now Geomni/Verisk), Maxar and CNES/Airbus. The mosaic 'cuts' where images have been blended together and captured in different seasons are readily apparent, often within the same 'timeline' data.

Aerial Imagery Limitations: Conclusion

9.41. Aerial photograph assessments are often based on sequences of historical imagery which provide a series of 'snapshots' of the landscape under different conditions. In contrast, LiDAR and multi-spectral data are typically gathered at a single or series of closely spaced points in time. Levelled features which are now only visible as cropmarks are not usually visible *via* LiDAR data unless they are recorded as substantially differing vegetation heights within a DSM, or the features causing the cropmarks are still extant as micro topographic differences in the ground surface.

9.42. The limitations of these data sources are appreciated and considered during survey and use of multiple data sources. Multiple times of survey increases the discovery

rate and certainty of interpretation from all airborne data sources when they are examined concurrently.

LiDAR Data

9.43. LiDAR data are collected for multiple environmental and engineering survey purposes and are therefore sometimes not in compliance with optimum timeframes for heritage survey requirements. An optimum LiDAR survey date for recovery of micro and macro topographic heritage data spans late November to mid-March in the northern hemisphere. This is when leaf canopy and vegetation are at their lowest and a higher proportion of bare earth is exposed in both woodland and open areas to ensure that the laser pulses reach and return to and from the ground in sufficient density to record topography to create an accurate and detailed DTM.

9.44. Whilst of excellent high resolution, some data are not gathered at an optimal time for specific heritage survey purposes, as they are provided to serve the needs of multi-disciplinary surveys. A lower resolution survey captured during the winter months very often provides more data due to the lack of intervening vegetation which prevents sufficient laser points from reaching the ground surface. A low density of vegetation and leaf canopy is essential to the effectiveness of LiDAR survey in that it ensures maximum penetration of light signals to the ground surface in vegetated areas. The LiDAR data are, however, of assistance in recording some micro and more macro topographic features which may indicate relict or extant archaeological features and historic landscapes. They were used over the survey area in multiple visualisations alongside the aerial photographs and satellite image data. LiDAR data are best interpreted and used in conjunction with modern and historic aerial photographs and maps to provide ground truth information, and this was achieved in this survey.

9.45. For LiDAR data captured during 'leaf / crop on' conditions, less data is recorded due to foliage and vegetation masking the route of the laser. Similarly, areas of water will absorb the laser giving no returned points.

9.46. The majority of the NLP LiDAR data were collected between October and March, with varied dates for smaller surveys.

9.47. When the point cloud is processed into a DTM, reduced ground coverage results in a simplified geometry surface interpolated from the few available data points which can obstruct features of interest.

9.48. The horizontal cell resolution of LiDAR data can also influence the detection rates of archaeological features. This can occur where the spacing of point measurements is sufficiently wide to conceal or reduce the visibility of small archaeological features. This may have affected this assessment in areas where LiDAR data were gathered at 2m, 1m and 50cm resolutions as opposed to the more detailed 25cm resolution data.

9.49. It is also important to note that LiDAR visualisation techniques are continually developing and advancing. The multiple visualisations now applied to DSM and DTM data *via* the RVT used for this survey are effective in heritage interpretation. Hillshade, and particularly fixed-direction Hillshade, visualisations do not show the correct position of the actual features, only the position of their virtual 'shadows' on the ground. It is thus important to use multiple visualisations of LiDAR data to ensure accurate positioning of recorded features and optimise the results.

LiDAR data: conclusion

9.50. The majority of the LiDAR data were captured at times of low leaf index; however these data did not reveal consistently significant topographic heritage assets over the whole of this area. This is due to the eroded and buried nature of the cropmarked sites which constitute the majority of the aerial evidence which is largely eroded to sub-surface level.

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- Due to the nature of aerial photographic evidence, Air Photo Services cannot guarantee that there may not be further archaeological features found during ground survey which are not visible on aerial photographs or that apparently 'blank' areas will not contain masked archaeological evidence.
- We suggest that if a period of six (6) months or more elapses between compilation of this report and field evaluation new searches are made in the appropriate photo libraries. Examination of any newly acquired aerial imagery is advised.
- The original working documents, being interpretation notes, copies, photographs, control information and digital data files will remain the property of Air Photo Services and be securely retained by it for three (3) years from the completion date of this assessment after which only the digital data files may be retained.
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