REPORT

Boston Alternative Energy Facility

Outline Written Scheme of Investigation

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Boston Alternative Energy Facility

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1 Outline Written Scheme of Investigation (WSI)

1.1 Project Background

1.1.1 This Outline Written Scheme of Investigation (OWSI) has been produced to set out the proposed approach to archaeological mitigation and investigations to be undertaken in association with the proposed Boston Alternative Energy Facility (hereafter 'the Facility').

1.1.2 This OWSI has been updated with regard to Relevant Representations from Historic England (RR-027) and Lincolnshire County Council (RR-014) and the outcomes of consultation with Heritage Lincolnshire, the Lincolnshire County Council Historic Environment Team (LCC HET) and Historic England, (herein 'cultural heritage stakeholders').

1.1.3 The Facility is proposed to be located approximately 2 km to the south of Boston town centre, Lincolnshire on land as set out on the **Location Plan** (document reference 4.1). The Application Site covers 26.8 hectares (ha) and is split in to two components: the area containing operational infrastructure for the Facility (the 'Principal Application Site'); and an area containing habitat mitigation works for wading birds (the 'Habitat Mitigation Area'). The Principal Application Site (NGR TF33950 42241) covers 25.3 ha and is neighboured to the west by the Riverside Industrial Estate and to the east by The Haven, a tidal waterway of the River Witham between The Wash and the town of Boston. The A16 public highway is located approximately 1.3 km to the west. The Habitat Mitigation Area covers 1.5 ha and is located approximately 170 m to the south east of the Principal Application Site, encompassing an area of saltmarsh and small creeks at the margins of The Haven.

1.1.4 The energy recovery plant will be an energy from waste using refuse derived fuel (RDF) as the feedstock to generate energy and, once constructed, the Facility will generate approximately 102 megawatts electric (MWe) (gross) of renewable energy and will deliver approximately 80 MWe (net) to the National Grid.

1.1.5 The Facility constitutes a project falling within the definition of a Nationally Significant Infrastructure Project (NSIP) and, as such, requires a Development Consent Order (DCO) to be submitted to the Planning Inspectorate, who will determine the application on behalf of the Secretary of State.

1.1.6 An Environmental Statement (ES) (document reference 6.2) has been produced by Royal HaskoningDHV, on behalf of the Applicant, Alternative Use Boston

Projects Ltd (AUBP), to form part of the DCO application. A Preliminary Environmental Information Report (PEIR), which formed the basis of the ES, was produced to present stakeholders with the results of initial assessment and to support statutory consultation. This PEIR was itself informed by a Scoping Opinion that was provided by the Planning Inspectorate in July 2018.

1.1.7 Feedback from consultees was used to inform the final proposed development scheme as well as the associated impact assessment contained within the ES.

1.1.8 As part of the Environmental Impact Assessment (EIA) process, potential impacts to cultural heritage from the proposed Facility have been assessed and the results presented in **Chapter 8 Cultural Heritage** of the ES (document reference: 6.2.8). Chapter 8 is supported by a Desk Based Assessment (DBA) (ES **Chapter 8, Appendix 8.1** (document reference 6.4.3)) which sets out the archaeological and historical baseline conditions and a detailed impact assessment, including an assessment of potential impacts to the settings of heritage assets.

1.1.9 A Geophysical Survey across specific areas of the Application Site was carried out in August 2020 to inform the ES (**Chapter 8, Appendix 8.2 Geophysical Survey Report: Boston Alternative Energy Facility** (document reference 6.4.4)). A summary of the results of the Geophysical Survey is provided below in **Section 1.7** of this OWSI, which identifies how the findings of the Geophysical Survey and the Heritage assessment has influenced the OWSI.

1.1.10 In addition, ~~the acquisition of~~a geoarchaeological borehole~~s~~ survey ~~is planned for~~ was undertaken in October 2021 in order to further inform understanding of the sub-surface deposits and the archaeological potential within the Application Site (Wessex Archaeology, 2022). The results of this ~~will be~~were ~~further~~ discussed in ongoing consultation with the cultural heritage stakeholders and this ~~a further update will be made to the~~ OSWI has been updated to reflect the outcomes. A summary of the approach to geoarchaeological recording, and subsequent phases of evaluation and mitigation, is set out in **Section 1.9** of this OWSI.

1.2 Study Area

1.2.1 The Application Site is situated in Skirbeck Quarter, 2.3 km to the south-east of Boston's historic core, directly west of The Haven (which is the tidal reach of the River Witham) and south of Boston Port. The Principal Application Site is approximately 3 m above Ordnance Datum (aOD) and the British Geological Survey (BGS, 2018) records Upper Jurassic Ampthill clay overlain by glacial till deposits within the area. This till is in turn overlain by thick alluvial clays, formed by marine inundations prior to fenland reclamation in the medieval period. Peat

~~layers~~ dated to the middle Neolithic period w~~ere~~ found within the vicinity, during works for the Boston Barrier project, at a depth of c. 8m ~~5 to 11 m~~ below the ~~current~~ modern ground surface~~, overlain by and interleaved in these alluvial deposits~~ (Environment Agency, 2016). A thin layer of peat was also found at 5.77m below ground level (bgl) in a geoarchaeological borehole from the site (Wessex Archaeology, 2022).

~~1.2.1~~1.2.2 For the purposes of the cultural heritage assessment undertaken for the ES, all Scheduled Monuments, Grade I and II* Listed Buildings and Conservation Areas within 3 km of the Application Site were assessed for potential impacts to their settings. All grades of Listed Building and all non-designated heritage assets (findspots, known buried remains from previous archaeological works, non-Listed Buildings of historical merit) were assessed within a 1 km buffer of the Application Site.

~~1.2.2~~1.2.3 The Cultural Heritage Study Area is illustrated on **Figure 8.1**.

1.3 Project Description

1.3.1 The Facility comprises the following main elements:

- a wharf and associated infrastructure (including re-baling facility, workshop, transformer pen and welfare facilities);
- an RDF bale contingency storage area, including sealed drainage, with automated crane system for transferring bales;
- conveyor system running in parallel to the wharf between the RDF storage area and the RDF bale shredding plant. Part of the conveyor system is open and part of which is under cover (including thermal cameras);
- bale shredding plant;
- RDF bunker building;
- thermal treatment plant comprising three nominal 34 MWe combustion lines (circa 120 megawatts thermal (MWth)) and associated ductwork and piping, transformer pens, diesel generators, three stacks, ash silos and ash transfer network; and air pollution control residues (APCr) silo and transfer network;
- turbine plant comprising three steam turbine generators, make-up water facility and associated piping and ductwork;
- air-cooled condenser structure, transformer pen and associated piping and ductwork;

- Lightweight Aggregate (LWA) manufacturing plant comprising four kiln lines, two filter banks with stacks, storage silos for incoming ash, APCr, and binder material (clay and silt), a dedicated berthing point at the wharf, silt storage and drainage facility, clay storage and drainage facility, LWA workshop, interceptor tank, LWA control room, aggregate storage facility and plant for loading aggregate / offloading clay or silt;
- electrical export infrastructure;
- two carbon dioxide (CO_2) recovery plants and associated infrastructure, including chiller units;
- associated site infrastructure, including site roads, pedestrian routes, car parking, site workshop and storage, security gate, control room with visitor centre and site weighbridge; and
- habitat mitigation works for redshank and other bird species comprising of improvements to the existing habitat through the creation of small features such as pools/scrapes and introduction of small boulders (Habitat Mitigation Works) within the Habitat Mitigation Area.

1.3.2 The energy from waste facility and the lightweight aggregate (LWA) plant will have associated stacks of approximately 80 m tall. A new 400 m long wharf will be constructed on The Haven with an adjacent storage area for materials unloaded from the ships. Conveyers will link this storage area to the materials processing facility. Overall, the Application Site is approximately 26.8 ha in size. Current design indicates that the structures on site (excluding chimney stacks) will not be taller than 44 m.

1.3.3 In addition to the Principal Application Site (containing the operational infrastructure), a Habitat Mitigation Area is also proposed to mitigate the loss of the roosting and foraging habitats for waders, but in particular, for redshank. This will involve the creation of shallow pools (maximum of 15 cm deep) in the existing marshy habitat, re-profiling the edges of existing pools and banks and, increasing the volume of 'roosting' rocks in the upper intertidal area.

1.4 Approach

1.4.1 A proposed mitigation strategy for the project is presented within the DBA and summarised in the ES (**Chapter 8, Table 8.13** and **Appendix 8.1**). This includes:

- Geoarchaeological assessment (analysis of borehole cores to be acquired post-consent during the pre-construction phase);
- Archaeological evaluation (geophysical survey or trial trench evaluation);

- Archaeological monitoring of construction (watching brief during piling and groundworks, including removal of any foreshore remains during construction of the wharf and works to create the Habitat Mitigation Area);
- Archaeological monitoring of dredging works and construction works for the wharf;
- Further archaeological fieldwork (set-piece excavation) or monitoring as required following results of evaluation works (geoarchaeological assessment, geophysical survey or trial trenching).
- Archaeological monitoring of the 'Roman Bank' during construction of footbridge;
- Heritage interpretation for public information, including public outreach and the provision of a display board following excavation of 'Roman Bank'; and
- Mitigation embedded in the design comprising:
  - use of standard profile cladding with a muted colour palette on external walls and lighting designed to a specification in order to reduce visual impact;
  - measures to enclose or contain potentially odorous elements, including the operation of Facility buildings under negative pressure; and
  - construction methodology to minimise noise during the construction phase, in accordance with British Standard (BS):5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites'.

1.4.2 With the exception of the geophysical survey carried out in August 2020 ~~(see **Section 1.3** below)~~, and a programme of geoarchaeological investigation ~~planned~~ undertaken in~~for~~ October 2021 (see **Section 1.7~~1.9~~** below), the delivery of the archaeological mitigation and further investigations will be undertaken post-consent. This approach has been consulted on with the cultural heritage stakeholders and this OWSI has been prepared to set out provisional outline methodologies for this work.

1.4.3 An updated, final WSI will be developed post-consent in consultation with the cultural heritage stakeholders and the Applicant. The delivery of the archaeological mitigation and investigations in the final WSI is secured by ~~the current drafting of~~ the draft DCO via Schedule 2, requirement 6~~, as submitted at Deadline 1~~ (document reference 2.1 (5~~1~~)), which will require the WSI to be approved by the relevant planning authority, following consultation with Historic England. Schedule 2, requirement 6 states ~~-~~that:

- (1) No part of Work Nos. 1, 2, 3, 4, 5 and 6 ~~-~~may commence until for that part a written scheme of investigation, reflecting the relevant mitigation measures

set out in the outline written scheme of investigation has been submitted to and approved by the relevant planning authority, following consultation ~~by the undertaker~~ with Historic England. ~~and~~

- (2) The scheme approved under sub-paragraph (1) must—
  - (a) identify areas where field work or a watching brief are required and the measures to be taken to protect, record or preserve any significant archaeological remains that may be found; and
  - (b) detail the measures for post-field work processing, assessment analysis and reporting of the results of archaeological work and the deposition of the archive.
- (3~~2~~) Work Nos. 1, 2, 3, 4, 5 and 6 must be carried out in accordance with the scheme referred to in sub-paragraph (1), unless otherwise agreed by the relevant planning authority.

1.4.4 The final WSI is also secured by ~~through the current drafting of~~ the dML via Schedule 9, requirement 15 (document reference 2.1(5~~1~~)) which states (with respect to Marine Archaeology) that:

- (1) The undertaker must submit an archaeological written scheme of investigation (WSI) and protocol for archaeological discoveries (PAD) in writing to the MMO for written approval in accordance with the procedure in Part 4~~5~~, following consultation with Historic England and the relevant planning authority, at least 6 weeks prior to the commencement of any licenced activity with the potential to affect buried archaeological assets.
- (2) The undertaker must not commence the licenced activities ~~-~~until ~~w~~ the MMO has approved in writing the submitted WSI and PAD.
- (3) Unless otherwise agreed by the MMO, all activities must adhere to the terms of the WSI and PAD as approved by the MMO.

1.4.5 The final WSI will be a 'point-in-time' document, with the specific methodology for each subsequent package of archaeological works to be taken forward through archaeological method statements produced under the umbrella of the WSI and agreed with the cultural heritage stakeholders and the Applicant prior to consent in the post-submission phase. Survey, evaluation and work package specific archaeological objectives will be established on a case-by-case basis with reference to all relevant project datasets (and associated archaeological and geoarchaeological interpretations) and to other relevant research and investigations with specific reference to established research agendas.

1.4.6 A heritage project meeting with the cultural heritage stakeholders took place on 4th October 2019. Following this meeting, the proposed mitigation pre-submission

was agreed to comprise of geophysical survey across the Application Site, namely in the form of magnetic survey, and followed by low-frequency electromagnetic methods. These methods were suggested by geophysical survey specialists and approved by the cultural heritage stakeholders due to the alluviated conditions of the Principal Application Site.

1.4.7 The magnetometry survey was proposed to identify the old river channel and any shallow subsurface remains, as well as any rich 'peaty' areas or pockets within the upper clays of the site.

1.4.8 The electromagnetic survey was proposed to potentially provide more depth to the results and identify possible buried land surfaces below the alluvium, as well as some broad depth information for the deposits.

1.4.9 The geophysical survey was undertaken in August 2020. The results are summarised in **Section 1.3** below, with the full survey report forming **Appendix 8.2** of Chapter 8 Cultural Heritage of the ES.

1.4.10 Following receipt of Relevant Representations from the cultural heritage stakeholders, a further meeting was held with Heritage Lincolnshire, LCC HET and Historic England representatives in attendance on 09/08/2021. ~~Following~~ During the meeting it was agreed to bring forward a programme of geoarchaeological investigation in order to further inform understanding of the archaeological potential of the Application Site (~~currently planned for October 2021,~~ see **Section 1.7~~1.9~~** below). As agreed, a programme of geoarchaeological investigation was undertaken in October 2021 and, ~~S~~subsequent to the completion of the survey, a meeting was held with Heritage Lincolnshire, LCC HET and Historic England representatives on 20/01/2022 to discuss the results and next steps regarding the implementation of the phased approach to archaeological mitigation presented in **Section 1.9**. It was concluded that, given the depths of alluvium overlying deposits with archaeological potential, the scope of any further archaeological evaluation and mitigation works will be considered, in consultation with the cultural heritage stakeholders, when the below-ground impacts of proposed development are known, following the planned, scheme wide geotechnical survey, which will incorporate geoarchaeological objectives, post-consent (see paragraphs 1.9.6 to 1.9.11). This version of the OWSI has been updated to reflect the outcomes of this consultation (Relevant Representations and meetings on 09/08/2021 and 20/01/2022).

1.5 Roles and Responsibilities

1.5.1 Overall responsibility for the implementation of the final WSI will lie with the Applicant who will ensure that its agents and contractors are contractually bound to adhere to the terms of the WSI.

1.5.2 Early post-consent, the Applicant will appoint an Archaeological Coordinator/Retained Archaeologist and a suitably qualified and experienced Archaeological Contractor to plan, programme and undertake the initial informative stages of evaluation and subsequent mitigation requirements. Roles and responsibilities will be clearly defined, and the establishment of programme will commence at the earliest possible opportunity in-line with other related key-milestones for the Facility. All archaeological evaluation and mitigation works will be timetabled into the work programme to ensure enough time is given for any required work.

1.5.3 In order that the post-consent archaeological works can be delivered effectively and in-line with expectations, appropriate and effective lines of communication and collaborative working will be established with the principal contractor(s), once appointed, in order to further ensure well planned and programmed archaeological works are undertaken to the satisfaction of all stakeholders.

1.5.4 The specific responsibilities of specialist archaeological contractors during subsequent phases of work will be set out in the work package specific WSIs (method statements).

1.5.5 The regulatory body responsible for enforcing conditions specified in the deemed marine licence (DML) is the Marine Management Organisation (MMO). The regulatory body responsible for enforcing the implementation of requirements within the DCO is the relevant Planning Authority in which the works are situated. The cultural heritage stakeholders, therefore, are as follows:

- Heritage Lincolnshire (as the archaeological advisor to Boston Borough Council who are the Local Planning Authority (LPA));
- LCC HET (as the archaeological advisor to LCC who are waste disposal authority in Lincolnshire and are a statutory consultee as part of the DCO process); and
- Historic England (as advisers to the MMO on heritage matters in the marine environment and with respect to the role of the Historic England Science Advisers in providing support to local authorities determining planning applications affecting archaeological sites).

1.6 Baseline Summary

1.6.1 A full assessment of baseline data, all heritage assets and assessment of the key heritage assets' setting can be found in **Appendix 8.1** of Chapter 8 of the ES.

1.6.2 The baseline conditions for cultural heritage were established through reference to the following key sources:

- Records of non-designated heritage assets from the Lincolnshire Historic Environment Record (LHER);
- National Heritage List for England (NLHE);
- Records of heritage assets and archaeological works from ARCHSEARCH Online;
- The Lincolnshire Historic Landscape Characterisation; and
- Historic Mapping.

1.6.3 The baseline data compiled from these sources were mapped in GIS and a gazetteer and illustrations of all heritage assets within the Study Area were produced (**Appendix 8.1, Figure A8.1 and A8.2** (document reference 6.3.4)). The data includes all known designated and non-designated assets.

1.6.4 Following the compilation of the historical and archaeological baseline, a site walkover covering the Principal Application Site was conducted to assess for any visible evidence of unknown heritage assets within the Principal Application Site, as well as any modern disturbance that may have impacted the area. Furthermore, heritage assets within the Study Area identified as possibly being impacted were also visited to assess their setting and identify whether the construction and operation of the Facility would impact on these assets or their setting.

1.6.5 There are no designated heritage assets within the Application Site. A total of six Listed Buildings are within 1 km, whilst four Scheduled Monuments and a further 22 Grade II* and I listed structures are found within 3 km.

1.6.6 Non-designated assets within 1 km are predominantly medieval to modern in date, in the form of buried deposits associated with farmsteads. The most significant non-designated asset in terms of the development is the 'Roman Bank'. This extant, currently poorly dated (through documentary evidence), earthwork passes through the centre of the Principal Application Site, consisting of a c.2 m high earthen flood bank. Documentary research suggests it could be of Anglo-Saxon origin, although no archaeological evidence has been found for this within the

local area. A public right of way follows the top of Roman Bank.

1.6.7 Potential archaeological remains were not identified within the Application Site from the DBA, although there is potential for palaeoenvironmental remains to survive within the thick alluvial clays, which also hold potential to provide valuable data on the past local landscape. Professional experience suggests that the alluvial geology would preclude the presence of shallow sub-surface buried archaeological remains within the Application Site. There is the potential for preserved organic artefacts (wood, leather etc.) within the clays however, including the potential for shipwrecks within the original course of the River Witham (prior to its canalisation at this section, after which it was named The Haven).

1.6.8 Key heritage assets (**Figure 8.1** of **Chapter 8** of the ES (document reference 6.3.3)) that were identified as having the greatest potential to be impacted by the Facility are summarised below These assets include known assets, as well as groupings of "potential" archaeological remains. Of most relevance to this WSI are the remains located within the Application Site itself (e.g. potential buried archaeological remains, foreshore remains, peat deposits). Whilst no further assessment of assets outside the Application Site is needed, information on these assets has been included below to provide context.

1.6.9 **Wybert's Castle** (Reference RHDHV01 in **Appendix 8.1**): This Scheduled Monument consists of a medieval moated site covering approximately 200 m^2. The central island inside the moat is raised above the surrounding land. Excavations in 1959-60 found evidence for 12th to 13th century occupation. As a Scheduled Monument with significant research value, this asset is deemed to be of **high** value.

1.6.10 **St Botolph's Church** (RHDHV26): This Grade I Listed church is a landmark for the region, dominating views in the vast fenland surrounding Boston. The church tower is the tallest parish church tower in England and was built in the 14th century. The tower is known as the 'Boston Stump' and is of significant local and regional historical importance. As a Grade I Listed Building of regional and national importance, this asset is deemed to be of **high** value.

1.6.11 **Church of St Nicholas, Skirbeck** (RHDHV07): This Grade II* Listed church has 13th century origins. It is at a prominent position on the northern bank of The Haven, at its junction with Maud Foster Drain. The church can be seen from some distance along the banks of The Haven. It is probable that it would have been a navigation marker in the past, used in conjunction with St Botolph's Church tower (RHDHV26). Due to it being a historical landmark and of architectural interest, the

significance of this asset is deemed to be **high**.

1.6.12 **Skirbeck Conservation Area** (RHDHV31): Designated in 1969, the area covers St Nicholas' Church and churchyard, Skirbeck Hall and grounds, 80-86 Fishtoft Road, and extends to The Haven's foreshore, including Maud Foster Sluice (RHDHV07). Modern developments in and around Skirbeck Hall have reduced the area's historic character, with the residential development not being particularly sensitive to the historic architecture. Views out of the Conservation Area across The Haven are limited by tree cover along Fishtoft Road, although wide-reaching views can be made from behind the church. Due to the impacts of modern development upon the character of the Conservation Area, this is a **medium** value asset.

1.6.13 **Maud Foster Sluice** (RHDHV06): This mid-19th century sluice is located at the southern end of Maud Foster Drain, which exits into The Haven. It is constructed of Gritstone with three elliptical archways. The structure is Grade II Listed. Due to this designation and its location within Skirbeck Conservation Area, it is deemed to be of **high** significance.

1.6.14 **Slippery Gowt Sluice** (RHDHV05): this is a well-preserved example of an early modern sluice that is Grade II Listed, designating it as a structure of special architectural and historical significance and so deemed to be of **high** significance. The Sluice was constructed in the mid-18th century, for the Court of Sewers, and built of red brick. It is currently situated south of the historic Boston landfill, with views southwards across open farmland.

1.6.15 **Wyberton Conservation Area** (RHDHV33): The Church of St Leodegar and Wyberton Park fall within the Wyberton Conservation Area. This area has a distinctly English country village characteristic, with a focal point of the church and lack of major development within the core adding to an appreciable historic setting. It is deemed to be of **medium** significance.

1.6.16 **The Roman Bank** (RHDHV65): This long running section of earthwork survives for approximately 4 km, heading south-eastwards from Boston and passes through the Principal Application Site. It is also known as 'Sea Bank'. The bank is also associated with a known bank that can be traced extending into Norfolk, forming an early sea wall. A section of comparable bank is also evident on the northern side of The Haven. This asset is non-designated and considered to be of local historical and archaeological interest. The asset's date of origin is currently unclear, although if an Anglo-Saxon or medieval date could be confirmed it may be a significant heritage asset for the local region and provide further information for these poorly understood early flood defences. As a non-designated upstanding

earthwork, it is deemed to be of **medium** significance.

1.6.17 **Prehistoric peat and historic alluvium** (RHDHV66): Evidence for prehistoric peat deposits was identified within the vicinity, during works for the Boston Barrier project. These were found at approximately 8 m below the current ground surface, overlain by alluvial clay deposits deposited over the past five millennia through marine inundation. These alluvial deposits were also encountered during archaeological evaluation for the adjacent Biomass UK No. 3 facility. No remains of archaeological significance have currently been identified within the alluvium, but this does not preclude their presence. This alluvial build up is evident throughout the local area, seen within the deposit mapping undertaken as part of the technical report (ES **Appendix 8.1**, **Section 7**), where all boreholes reviewed showed the local geology is made up of anywhere from 5 m to 11 m of alluvium. Within the Application Site the geoarchaeological borehole survey similarly showed alluvial deposits to 5.77m, 5.96m and 6.38m bgl within the three acquired boreholes, with a thin layer of peat evident at 5.77 to 5.88m bgl in BH01 only (Wessex Archaeology, 2022). ~~It is evident that these deposits could be within the Application Site and they~~These alluvial deposits could contain preserved archaeological remains (RHDHV96, see below). This asset has a potentially **high** significance.

1.6.18 **The Haven mud banks** (RHDHV90): These mudbanks were noted on either side of The Haven's channel during low tide and are far reaching, continuing along The Haven towards the Wash. They form an integral part to the channel, and the wider area's historic landscape character. No foreshore remains (RHDHV91, see below) were seen during the site visit on the southern bank, but the anaerobic conditions of the banks would aid in the preservation of organic remains, similar to the known alluvial deposits within the area (RHDHV66). This asset has a **low** significance although has the potential to contain foreshore remains (RHDHV91) of **high** significance.

1.6.19 **Potential foreshore remains** (RHDHV91): The only foreshore remains identified during the site visit were a grouping of stakes within the mudbanks on The Haven's southern bank. A date for these remains is unknown, although a brief visual inspection indicated they were not of particular age. It is evidence for the preservation quality of the mudbanks however, suggesting that it is possible that remains of archaeological merit could survive within the lower layers of The Haven's mudbanks and the lower alluvial deposits. Potential foreshore remains includes the potential for the remains of historic vessels repurposed to form backside revetments or wharfs. These potential assets are of potentially **high** significance.

1.6.20 **Buried archaeological remains** (RHDHV96): This 'asset' encompasses a number of possible archaeological remains that could be found within the Application Site, and cross-references with the prehistoric peat deposits, historic alluvial deposits and foreshore remains (RHDHV66 and RHDHV91). Any possible buried remains within the Application Site, in the form of either preserved material within the alluvium, or features cut into the alluvium, such as infilled ditches, could be impacted by piling or open-cut excavation of a depth deeper than the overlying topsoil. The remains potentially within alluvial deposits could range from natural organic remains of geoarchaeological interest (peat deposits, natural wood, etc.) to the remains of any historic vessel hulks that could survive in the original route of The Haven. These assets are of potentially **high** significance.

1.7 Geophysical and Geoarchaeological Survey

1.7.1 As identified during consultation with the cultural heritage stakeholders, a geophysical survey was conducted on specific areas within the Application site: the areas of the lightweight aggregate plant within the east of the site (Area 1), the area of the main thermal treatment plant within the south (Area 2), and the laydown areas within the west (Area 3 and 4). The geophysical survey comprised of both a fluxgate magnetometer survey and an electromagnetic survey.

1.7.2 The geophysical survey was conducted by Magnitude Surveys Ltd. The magnetic survey commenced on 11/08/2020 for two days and the electromagnetic survey commenced on 17/08/2020 for two days, with the objective to assess the subsurface archaeological potential of the survey area. The geophysical survey report, results and figures are presented in **Appendix 8.2 Geophysical Survey: Boston Alternative Energy Facility** of the ES and are summarised below.

1.7.3 The magnetic survey was affected by a highly magnetically contrasted topsoil, related to the soil and water chemistry of the survey environment. However, anomalies of anthropogenic origin could be identified. These include a possible enclosure ditch (**ES Appendix 8.2: Figure 10**) and two locations of possible burning or production activity (**ES Appendix 8.2: Figure 7**). The location of these anomalies being close to the field edges, and the strongly contrasted background of the survey area made it difficult to suggest a possible date, and therefore degree of possible archaeological significance.

1.7.4 Other anomalies interpreted as ditches and made ground have corresponding anomalies within the electromagnetic data and are more secure in their interpretation.

1.7.5 The electromagnetic data also allowed the identification of a probable

palaeochannel in the underlying sediments within the southern half of Area 2 (**ES Appendix 8.2: Figures 13, 15 and 17**). Cutting across the north-east corner of the site, passing through Areas 1, 3 and 4, a potential spur or unmapped extension of a known medieval earthwork or a natural slight rise in the topography that was exploited to build this (**ES Appendix 8.2: Figures 12, 14 and 16**). Bisecting Area 2 (**ES Appendix 8.2: Figure 13**) from east to west, there is a strong linear anomaly interpreted as a canalised or ploughed-out drainage ditch or stream.

1.7.6 Lastly, only one of the linear anomalies is interpreted as a service (**ES Appendix 8.2: Figure 17**), thought to carry water or another liquid rather than cabling, carried within plastic or concrete piping.

1.7.7 In conclusion, while the results show a "complicated coastal landscape with evidence of recent and past management and reclamation in the form of drains and ground consolidation" equally "the results do not suggest the presence of significant or extensive archaeological features". However, it is also understood that the tidal flat deposits have created a noisy magnetic environment which may be masking more subtle archaeological features. Therefore, following the geophysical survey, further evaluation ~~including~~ through a targeted geoarchaeological borehole survey was undertaken (Wessex Archaeology, 2022). The final survey report following completion of this work, and review by cultural heritage stakeholders, was submitted as a supporting document at Deadline 8 (REP8-008).

1.7.8 A total of four targeted geoarchaeological boreholes were recommended, each of which was located in order to investigate selected anomalies identified during the previous geophysical survey, including:

- One of the localised areas of burning, potentially related to salt production activity (BH01);
- The possible earthwork or bank related to the medieval 'Sea Bank' marked on OS maps of the area (BH02); and
- The possible palaeochannel running roughly east to west through Area 2, towards the estuary of the River Witham (BH04).

1.7.9 A Terrier window sampling rig was used to extract sleeved cores 1.0m in length to the top of the sands and gravels, to a maximum depth of 7m bgl or refusal. The cores were split and described (including photographs) on-site by the attending geoarchaeologist as work proceeded. Where sequences were recorded that warranted further investigation, they were sealed and returned to the Wessex Archaeology laboratory for further detailed geoarchaeological investigation.

1.7.10 Due to boggy and uneven ground conditions, it was not possible to drill the fourth borehole located within the possible palaeochannel (BH03). Based upon the results of the three successfully drilled boreholes, it was agreed with the Historic England Science Advisor for the East Midlands that the fourth borehole would be unlikely to provide any additional information, over and above that provided by BH04, and a return to ~~s~~Site would not be required. Given the consistent sequence of sediments recorded across the Site, including those within the possible palaeochannel, three boreholes were considered sufficient to assess the geoarchaeological potential of the deposits present at the Site.

1.7.11 No archaeological remains, including any remains or deposits associated with the earthwork in the area of BH01 and the possible burning in the area of BH02, were encountered in any of the hand dug inspection pits or boreholes. Deposit modelling was undertaken resulted in the production of a north-south aligned stratigraphic profile (transect) illustrating the key deposits across the Site (Figure 3 in Wessex Archaeology, 2022). The geoarchaeological and archaeological potential of the deposits at the Site were summarised by Wessex Archaeology as follows:

- **Pleistocene river terrace deposits** equivalent to the buried Floodplain gravel of the River Witham and the Holme Pierrepont terrace of the Trent, were encountered widely across the Site. The river terrace deposits provide the undulating topographic template upon which Holocene alluvial sediments have been deposited.
- Prior to widespread alluviation during the Holocene, the surface of the gravel would have included areas of higher, drier ground adjacent to the floodplain, and as such there is potential for the preservation of prehistoric archaeology on the surface of the Pleistocene gravels. However, these deposits are deeply buried, recorded at between 5.88 and 6.62m bgl.
- The surface of the gravel is considered to be medium geoarchaeological potential (including the potential for both prehistoric archaeology and buried soils), but the coarse-grained (gravel-rich) deposits of the gravel body are considered to be low geoarchaeological potential.
- **Alluvium** was recorded across the Site overlying the Pleistocene river terrace deposits. The alluvium at the ~~s~~Site is comprised of three units: a basal peat (recorded only in BH01), the silt-rich lower alluvium with frequent detrital organic material, and the clay-rich upper alluvium.
- The deposits of the lower and upper alluvium are in most cases of low geoarchaeological potential, except where they are present in close

association with the peat unit in BH01 (i.e. where radiocarbon dating of the peat can provide a reliable chronological context).

- The inorganic alluvial sediments have the potential to preserve microfossil remains (ostracods, foraminifera, diatoms) that are useful in establishing the marine or freshwater origin of deposits, but these may be of uncertain source area.
- The archaeological potential of the alluvium is low, except where it is associated with the peat deposits and may therefore have the potential to contain preserved archaeology, including waterlogged archaeology.
- **Peat** was recorded only in BH01, 0.11m thick and recorded at between -2.70 to - 2.81m OD (5.77 to 5.88m bgl). Although relatively thin, the peat deposits are assigned a high geoarchaeological potential on the basis of their potential to contain waterlogged palaeoenvironmental and archaeological remains. More widespread, thicker peat units have been identified elsewhere in the valley of the Witham and the north-western Fens, but peat and organic-rich deposits are relatively under studied within Boston itself (see Heritage Lincolnshire 2013).
- On the basis of radiocarbon dating of the basal peat elsewhere in the valley of the River Witham, it may be of Neolithic to Bronze Age date or earlier. Establishing the chronology of this deposit in the first instance would help to assess the potential of the deposit for contributing to the valley-wide palaeoenvironmental research design that has been published by the Witham Valley Archaeology Research Committee (French and Rackham 2003; Stocker and Everson 2003) and other regional research agendas.

~~1.7.7~~1.7.12 Wessex Archaeology (2022) concluded that the scope of any further archaeological evaluation and mitigation works will need to be considered when the below-ground impact of proposed development are known, as this may have a direct impact on the requirement for and extent of any further archaeological evaluation and mitigation works. Recommendations for further analysis on retained samples, to be undertaken alongside geoarchaeological assessment as part of the planned, scheme wide geotechnical survey, and further investigation including ~~investigation and~~ targeted trial trenching ~~will form the initial stages of archaeological works as~~are set out in **Section 1.9** below.

1.8 Impact Assessment Summary

1.8.1 The Cultural Heritage chapter of the ES concludes that potential impacts upon heritage assets, once mitigation is taken into account, are **negligible** to **minor adverse** (i.e. not significant according to the criteria used in the Heritage

assessment). The impacts through construction, operation and decommissioning are summarised below in **Table 1-1**.

1.8.2 Potential impacts as a result of changes to physical process (e.g. changes in sedimentation/erosion within The Haven) were assessed and correlated with **Chapter 16** of the ES (**Estuarine Processes,** document reference 6.2.16). No impact/change in the baseline was identified, due to the current estuarine environment, and, correspondingly, potential indirect impacts to heritage assets from changes to physical processes are not anticipated to occur.

1.8.3 The assessment also concludes that the potential for cumulative impacts is limited to potential cumulative changes to the setting of heritage assets during the construction phase when considered alongside the Boston Barrier, although, this represents a worst-case position, because the Barrier works are due to be completed before the Boston Alternative Energy Facility enters the construction phase. The Boston Barrier will introduce a new structure into the landscape which, cumulatively with the Facility, has the potential to further affect the setting of Maud Foster Sluice, St Nicholas Church and the Skirbeck Conservation Area during operation. This is due to the increase in height of the current flood bank along The Haven, and the Boston Barrier's height, which may work together the reduce visibility between heritage assets. Overall, however, this is considered to result in a non-significant impact, particularly when considering the beneficial results of the Boston Barrier Project (a lowering of flood risk to heritage assets).

1.8.4 The potential for encountering buried archaeological remains (shallow sub-surface – pits, ditches etc.) is considered low from the evidence identified as part of the DBA, geophysical survey and geoarchaeological borehole survey. However, ~~T~~there is potential for geoarchaeological remains and valuable information to be held within the alluvial clays and ~~. E~~evaluation works undertaken post-consent will further identify this potential and allow for suitable mitigation measures to be identified and agreed with all stakeholders.

Table 1-1 Impact Assessment Summary

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Effect
Construction						
1: Direct impact to potential buried archaeological remains.	66: Prehistoric peat deposits and historic alluvium	High	High	Major adverse	Archaeological evaluation and recording.	Minor adverse (not significant)
	90: The Haven Mudbanks	Low	High	Major adverse	Archaeological evaluation and recording.	Minor adverse (not significant)
	91: Foreshore remains	High	High	Major adverse	Archaeological evaluation and recording.	Minor adverse (not significant)
	96: Buried archaeological features	High	High	Major adverse	Archaeological evaluation and recording.	Minor adverse (not significant)
2: Indirect impact upon setting of designated heritage assets	1: Wybert's Castle	High	Negligible	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)
	5: Slippery Gowt Sluice	High	Negligible	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)
	6: Maud Foster Sluice	High	Negligible	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Effect
	7: Parish Church of St Nicholas	High	Negligible	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)
	26: St Botolph's Church	High	Negligible	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)
	31: Skirbeck Conservation Area	Medium	Low	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)
	33: Wyberton Conservation Area	Medium	Negligible	Minor adverse	Standard construction hours & practices	Minor adverse (not significant)
3: Direct impact upon above ground heritage asset	65: The 'Roman Bank'	Medium	Medium	Minor negative	Archaeological monitoring	Minor adverse (not significant)
4: Indirect impact upon setting of recorded non-designated assets	65: The 'Roman Bank'	Medium	Medium	Moderate adverse	Public information board (enhancement)	Minor adverse (not significant)
Operation						

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Effect
1: Direct impact to potential buried archaeological remains.	No further impact					
2: Indirect impact upon setting of designated heritage assets	1: Wybert's Castle	High	Negligible	Minor adverse	n/a	Minor adverse (not significant)
	5: Slippery Gowt Sluice	High	Negligible	Minor adverse	n/a	Minor adverse (not significant)
	6: Maud Foster Sluice	High	Negligible	Minor adverse	n/a	Minor adverse (not significant)
	7: Parish Church of St Nicholas	High	Negligible	Minor adverse	n/a	Minor adverse (not significant)
	26: St Botolph's Church	High	Negligible	Minor adverse	n/a	Minor adverse (not significant)
	31: Skirbeck Conservation Area	Medium	Low	Minor adverse	n/a	Minor adverse (not significant)
	33: Wyberton Conservation Area	Medium	Negligible	Negligible adverse	n/a	Minor adverse (not significant)
3: Direct impact upon above ground heritage asset	No further impact					
4: Indirect impact upon setting of recorded non-designated	65: The 'Roman Bank'	Medium	Medium	Moderate adverse	Public information board (enhancement)	Minor adverse (not significant)

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Effect
assets						
Decommissioning						
1: Direct impact to potential buried archaeological remains.	66: Prehistoric peat deposits and historic alluvium	High	Negligible	Minor adverse	Previous works during construction will have mitigated	Minor adverse (not significant)
	90: The Haven Mudbanks	High	Negligible	Minor adverse	Previous works during construction will have mitigated	Minor adverse (not significant)
	91: Foreshore remains	High	Negligible	Minor adverse	Previous works during construction will have mitigated	Minor adverse (not significant)
	96: Buried archaeological features	High	Negligible	Minor adverse	Previous works during construction will have mitigated	Minor adverse (not significant)
2: Indirect impact upon setting of designated heritage assets	1: Wybert's Castle	High	Low (positive)	Minor beneficial	n/a	Minor beneficial
	5: Slippery Gowt Sluice	High	Negligible (positive)	Negligible beneficial	n/a	Negligible beneficial
	6: Maud Foster Sluice	High	Low (positive)	Minor beneficial	n/a	Minor beneficial
	7: Parish Church of St Nicholas	High	Low (positive)	Negligible beneficial	n/a	Negligible beneficial

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Effect
	26: St Botolph's Church	High	Low (positive)	Negligible beneficial	n/a	Negligible beneficial
	31: Skirbeck Conservation Area	Medium	Low (positive)	Negligible beneficial	n/a	Negligible beneficial
	33: Wyberton Conservation Area	Medium	Low (positive)	Negligible beneficial	n/a	Negligible beneficial
3: Direct impact upon above ground heritage asset	No impact					
4: Indirect impact upon setting of recorded non-designated assets	65: The 'Roman Bank'	Medium	Low (positive)	Minor beneficial	n/a	Minor beneficial

1.9 Outline Methodologies

1.9.1 The following section sets out the proposed evaluation and mitigation methodologies proposed within the ES, which have been agreed following consultation with the cultural heritage stakeholders. Each phase of mitigation works, or package of works to be undertaken, will be detailed within separate method statements produced by the Applicant and presented to Local Authority Archaeological Advisors (Heritage Lincolnshire and LCC HET) and Historic England for review, comment and approval before any on-site work is undertaken.

1.9.2 Commencement of any archaeological mitigation works is expected to begin following consent of the DCO application. The results of the geophysical survey conducted in August 2020 indicated the presence of a probable palaeochannel, a possible medieval earthwork or natural slight rise in topography, a possible enclosure ditch, and two locations of possible burning or production activity. However, no archaeological remains, including any remains or deposits associated with the earthwork in the area of BH01 and the possible burning in the area of BH02, were encountered in any of the hand dug inspection pits or boreholes during the geoarchaeological survey undertaken in October 2021.

~~1.9.2~~1.9.3 Whilst the overall conclusion was that the results do not suggest the presence of significant or extensive archaeological features, there are areas of potential interest. The results of the geophysical and geoarchaeological survey inform the further mitigation methodologies detailed below.

Phase 1 - Geoarchaeological Assessment

1.9.4 The targeted geoarchaeological borehole survey undertaken in October 2021 revealed the presence of a sequence of Pleistocene river terrace deposits, overlain by alluvium with a relatively thin layer of peat identified in a single borehole (BH01). Wessex Archaeology have retained selected samples for further analysis and, in particular, palaeoenvironmental assessment and scientific dating of the peat deposit has the potential to address selected Strategic Objectives identified in the Research Agenda and Strategy for the Historic Environment of the East Midlands (https://researchframeworks.org/emherf/), in particular those associated with the Neolithic through to Bronze Age (and potentially the Mesolithic, should the peat deposits date to this period).

~~1.9.3~~ Wessex Archaeology (2022) identify that aim of this assessment would be to undertake a programme of rangefinder radiocarbon dating to establish a chronology for the peat deposits, and to determine the state of preservation of key palaeoenvironmental remains (for example pollen, seeds, diatoms, Foraminifera

and Ostracoda). This work will establish the potential of the deposits to contribute to the Strategic Objectives, informing on the need for and scope of further paleoenvironmental analysis and scientific dating where appropriate. It is recommended that this analysis is undertaken alongside additional geoarchaeological assessment which will be progressed in conjunction with planned scheme-wide geotechnical survey. ~~As outlined above (**Paragraph 1.6.17**), evidence for prehistoric peat deposits has previously been identified within the vicinity of the Study Area, at approximately 8 m below the current ground surface, overlain by alluvial clay deposits. In addition, a probable palaeochannel has been interpreted from the acquired geophysical data. In general, the area around Boston has a very good potential for preserved palaeoenvironmental remains and geoarchaeological deposits which can inform historic landscape development, due to its topographic and geological location, situated within a low-lying fen landscape with a high water table and anaerobic conditions.~~

~~1.9.4 Following further consultation with cultural heritage stakeholders during the meeting held on 09/08/2021 it was agreed to bring forward a programme of geoarchaeological investigation in order to ground truth features identified from the geophysical survey (including the areas of burning, potential earthwork and palaeochannel) and to provide additional information to clarify the nature of sub-surface deposits, and (geo)archaeological potential, within the Application Site. Geoarchaeological specialists at Wessex Archaeology will undertake a limited number of boreholes at targeted locations within the Application Site, currently planned for October 2021. A detailed method statement for the works (work package WSI) is currently being prepared by Wessex Archaeology for consultation and agreement with the cultural heritage stakeholders. Following agreement on the specific approach, and completion of the works, this OWSI will be further updated to take account of the results and to include recommendations for further assessment and investigation.~~

1.9.5 ~~In addition, a programme of engineering led geotechnical ground investigations is planned to take post-consent to inform detailed design for the project.~~ This will provide a further opportunity to integrate geoarchaeological analysis of continuous boreholes and vibrocores taken during the pre-development and post-consent phase which would add to the current knowledge of the past environment within the area.

1.9.6 Although the scope and specification of the ground investigations is yet to be finalised, both the footprint of the facility and wharf area will be targeted through the planned ground investigations. This is secured through Schedule 2,

requirement 10 (Contamination) ~~9~~ of the final ~~draft~~ DCO, submitted at Deadline ~~9~~1, which requires that, "No part of the authorised development may commence until intrusive ground ~~–~~investigations have been carried out for the purpose of assessing ground conditions". Although the wharf area is not specified separately, it is anticipated that a different approach to the intertidal/subtidal areas would be required, compared to onshore, which could include vibrocoring from a vessel rather than a shore based rig.

1.9.7 The Applicant will procure the services of a specialist geoarchaeological contractor to provide advice at the planning stage for geotechnical ground investigations to ensure that appropriate techniques are used to allow for geoarchaeological assessment and analysis. This ~~will~~ could include the acquisition of cores purely for geoarchaeological purposes if required. Geoarchaeological monitoring of ground investigation works would be undertaken, with cores/samples taken for analysis off-site. Following this, if required, palaeoenvironmental analysis and dating will then be undertaken on deposits identified as being potentially significant. This would be undertaken alongside analysis of the samples retained from the October 2021 survey.

1.9.8 The primary aim of subsequent geoarchaeological assessment would be the production of a Quaternary (sedimentary) deposit model and characterisation of the archaeological potential of the sub-surface deposits which would, in turn, inform **Phase 2 Trial Trench Evaluation** as discussed below. This will build upon the initial deposit model informed by the October 2021 borehole survey and presented in the survey report (Wessex Archaeology, 2022).

1.9.9 Post-consent, the cultural heritage stakeholders, and specifically the Historic England Science Advisor for the East Midlands will be consulted on the scope of the geoarchaeological monitoring and assessment and all geotechnical investigations. Subsequent geoarchaeological assessments commissioned by the Applicant will be undertaken in accordance with industry best practice as set out in:

- Environmental Archaeology: A Guide to the theory and practice of methods, from sampling and recovery to post-excavation (Historic England 2011);
- Geoarchaeology: using earth sciences to understand the archaeological record (Historic England 2015a); and
- Deposit Modelling for Archaeology: Guidance for Mapping Buried Deposits (Historic England, 2020).

1.9.10 Prior to the commencement of any site investigation campaign a method

statement will be issued by the Applicant to the cultural heritage stakeholders for consultation setting out the specific details of the campaign once the geoarchaeological requirements and locations have been established.

1.9.11 The results of geoarchaeological assessment will be compiled as an archaeological report consistent with the requirements set out in **Section 1.12** below. Reviewing the data gathered from the geoarchaeological investigations will also enable the impacts of the scheme, including piling, on the archaeological remains to be better understood and greatly increase the chance of ensuring that a sustainable foundation scheme or suitable mitigation can be developed (see **Phase 3 - Archaeological Monitoring and Excavation** below).

Phase 2 - Trial Trench Evaluation

1.9.12 Geophysical survey is ordinarily followed by trial trenching in order to ground truth identified features and provide further information on the likely presence of buried archaeological remains. However, given the ~~anticipated~~ depths of alluvium across the Application Site and the results of the geophysical survey, during which it was noted that magnetic noise in the tidal flat deposits may be masking more subtle archaeological features, it has been agreed that geoarchaeological recording and palaeoenvironmental analysis of samples acquired from boreholes (as part of the planned ground investigations described above) represents a key information gathering phase in the process of determining an appropriate and proportionate evaluation and subsequent mitigation strategy.

1.9.13 As a comparison, no archaeological features or artefacts were revealed during trial trenching for the adjacent Biomass UK No. 3 facility. Trenches were dug to c. 2m deep and then all but one trench were deepened to beyond 2m, to determine the range of deposits. The deepest deposit encountered in the machine cut sondages was a plastic dark grey clay with organic traces, which may represent a period when vegetation was able to grow on a possibly Roman land surface, overlain by post-Roman alluvial deposits indicative of marine inundation. In order to reach deposits at these depths with trial trenching, an informed and targeted approach is required.

1.9.14 The results of the geoarchaeological assessment (and potentially further analysis) will reveal ~~if~~ where non-alluvial geology might be~~is~~ encountered ~~anywhere~~ within the Application Site~~area~~. This geology could indicate the presence of buried archaeological features or deposits that would require traditional archaeological excavation (e.g. infilled ditches or pits, associated with medieval activity nearby). Following the geophysical survey results and geoarchaeological assessment, a phase of trial trenching will, therefore, be undertaken to 'ground-truth' the

geophysical results.

1.9.15 The approach to evaluation (and subsequent excavation if required) will be established post-consent in consultation with the cultural heritage stakeholders and in accordance industry best practice as set out in:

- Chartered Institute for Archaeologists (CIfA) (2014a) Standard and guidance for archaeological excavation;
- CIfA (2014b) Standard and guidance for archaeological field evaluation;
- CIfA (2014c) Standard and guidance for the collection, documentation, conservation and research of archaeological materials;
- EAC Guidelines for the Use of Geophysics in Archaeology (Schmidt et al 2016);
- Lincolnshire Archaeology Handbook (Lincolnshire County Council, 2019); and
- Waterlogged Organic Artefacts Guidelines on their Recovery, Analysis and Conservation (Historic England, 2018).

1.9.16 The geophysical survey was undertaken in August 2020 with the aim of identifying any anomalies representing archaeological sites and features within the Application Site, and specifically within the footprint of consented development activities as appropriate. The data will be further considered alongside the results of the geoarchaeological assessment and ~~desk-based assessment~~DBA undertaken to date and will contribute directly to informing archaeological trial trench locations and positioning, if required, and the production of trench location plans for approval by the cultural heritage stakeholders.

1.9.17 Prior to the commencement of any stage of archaeological evaluation a method statement will be issued to the cultural heritage stakeholders by the Applicant setting out the specific details of the work package (i.e. trial trenching) once the requirements and locations have been established. Any further requirements for archaeological excavation would be agreed with the Applicant and the cultural heritage stakeholders.

1.9.18 The results of each stage of archaeological evaluation (and excavation, if required) will be compiled as archaeological reports consistent with the requirements set out in **Section 1.12** below.

Phase 3 - Archaeological Monitoring and Excavation

1.9.19 Dependent upon the final detailed design and construction methodology, and

upon the results of the geoarchaeological assessment and any subsequent archaeological evaluation, archaeological excavation and / or monitoring of groundworks for the Facility, the wharf, the Habitat Mitigation Area and any associated infrastructure may be required. This would be undertaken as set-piece excavation pre-construction, or archaeological watching brief during, for example, piling, or excavation of the pile caps, and during foreshore works and dredging and excavation of the berthing pocket in The Haven.

1.9.20 With regard to piling, in finalising the design, account will be taken of relevant guidance including Piling and Archaeology: Guidance and Good Practice (Historic England, 2019) alongside the results of the **Phase 1 Geoarchaeological Assessment** and **Phase 2 Trial Trenching Evaluation** in order to minimise impacts to buried archaeology. A detailed methodology for piling and enabling works, and associated archaeological requirements, including on site monitoring if appropriate, will be set out in a method statement to be prepared in consultation with the cultural heritage stakeholders.

1.9.21 It is currently assumed that dredging will be undertaken at low tide, initially from the shore by mechanical excavator. Monitoring and recording of archaeological deposits within the channel and mudbank may be difficult under these conditions and it is proposed that a scheme of dredging management be agreed with the cultural heritage stakeholders, post-consent, to allow for monitoring within identified zones where recording will be of the highest quality allowable. If foreshore remains are identified during monitoring, excavation and recording during low-tide may be required.

1.9.22 As required by the dML (via Schedule 9, requirement 15) the final WSI will also set out the approach to implementing a PAD during construction. As set out in the Historic England guidance for marine archaeology in ports and harbours (Cooper and Gane, 2016), reporting protocols are a mechanism designed to allow for the efficient reporting and recording of archaeological material that is inadvertently found by developers or their contractors during the course of planned works. As such, the PAD will represent a ‘safety net’ for recording unexpected finds that may otherwise have been lost during the dredging wharf construction.

1.9.23 Industry standard protocols for the marine aggregates industry and offshore renewables industry have been proven to be an effective means of ensuring the inclusion of unanticipated finds and heritage assets within regional and national databases. In summary the approach to the PAD is anticipated to mirror these formal industry protocols as follows:

- Each vessel/work team undertaking the proposed dredging and wharf construction will have an appointed Site Champion, responsible for reporting discoveries to a Nominated Contact, usually an appointed individual within the client's project team;
- Should an archaeological find be made, the Site Champion will inform the Nominated Contact. They will then report the find to an archaeological contractor appointed to support the implementation of the PAD;
- The archaeological contractor will provide prompt advice to the Nominated Contact in order to effectively address archaeological discoveries and will liaise with the cultural heritage stakeholders and other relevant stakeholders (such as the Ministry of Defence and Receiver of Wreck) and seek further specialist advice if required; and
- In the event of a significant discovery, the scope of any additional investigation and mitigation would be agreed on a case by case basis in consultation between the Applicant and cultural heritage stakeholders and would be set out in a method statement undertaken in consultation with the cultural heritage stakeholders.

1.9.24 The archaeological contractor or co-ordinator involved in the monitoring of any foreshore and dredging works and implementation of the PAD associated with the wharf construction will be a specialist in marine archaeology, to ensure the monitoring is undertaken to industry best practice.

1.9.25 The approach to archaeological monitoring, and to the excavation and recording of any foreshore remains if required, will be formalised post-consent in consultation with the cultural heritage stakeholders and in accordance industry best practice as set out in:

- CIfA (2014a) Standard and guidance for archaeological excavation;
- CIfA (2014c) Standard and guidance for the collection, documentation, conservation and research of archaeological materials;
- CIfA (2014d) Standard and guidance for nautical archaeological recording and reconstruction;
- CIfA (2020) Standard and guidance for an archaeological watching brief;
- Cooper and Gane (2016) The Assessment and Management of Marine Archaeology in Port and Harbour Development; and
- Preserving Archaeological Remains Decision-taking for Sites under Development (Historic England, 2016); and

- Waterlogged Organic Artefacts Guidelines on their Recovery, Analysis and Conservation (Historic England, 2018).

1.9.26 Once the final detailed design and construction methodology has been established post-consent, an archaeological monitoring plan and scheme of dredging management will be issued as a method statement by the Applicant for agreement with the cultural heritage stakeholders. Any further requirements for archaeological excavation would be agreed by the Applicant in consultation with the cultural heritage stakeholders.

1.9.27 The results of archaeological monitoring (and excavation, if required) will be compiled as an archaeological report consistent with the requirements set out in **Section 1.12** below.

Phase 3a - Archaeological Monitoring and Investigation of the 'Roman Bank'

1.9.28 As described above, the Roman Bank earthwork survives for approximately 4 km, heading south-eastwards from Boston and passing through the Principal Application Site, although the date of the origin of this feature is currently unknown. Archaeological survey and investigation of the 'Roman Bank' during construction works could significantly enhance current understanding of the earthwork and its local and regional significance with respect to understanding early flood defences.

1.9.29 Works would require a topographical survey of any section of bank that requires removal, followed by archaeological monitoring at the location where the footbridge will be installed. The width of the bank that would need to be removed will be confirmed through finalisation of the design of the footbridge, however it is currently proposed that a depth of 6 m, 2.6 m wide section either side of the existing Roman Bank will be modified for the construction of the footbridge support and subsequently backfilled and compacted after the construction of the bridge. Additionally, improvements to the Public Right of Way that follows the line of the Roman Bank within, and close to, the Application Site will be provided in an Outline PRoW Design Guide and submitted to the Examination. Full account will be made of the Roman Bank and the final PRoW Design Guide will be subject to review by the cultural heritage stakeholders with opportunities extended for an appropriate level of monitoring.

1.9.30 The groundworks consisting of the installation of the footbridge, with the removal of the required sections of the existing Roman Bank would be in attendance and supervised by a suitably qualified and experienced archaeologist, to ensure monitoring is undertaken to the industry best practice.

1.9.31 The approach to archaeological monitoring, and to the excavation and recording of any remains if required, will be established post-consent in consultation with the cultural heritage stakeholders and in accordance industry best practice as set out in:

- CIfA (2020) Standard and guidance for an archaeological watching brief; and
- Lincolnshire County Council (2019) Archaeology Handbook.

1.9.32 This phase of work will likely be undertaken during a similar time frame as some of the other on-site monitoring/ archaeological excavation works during construction.

1.9.33 The results will be compiled as an archaeological report consistent with the requirements set out in **Section 1.12** below.

1.10 Heritage interpretation

1.10.1 Heritage interpretation to inform and educate the public about the history of the local area can be incorporated into the project. Of particular note, following excavation of the 'Roman Bank', a display board could be designed and placed at an accessible location on a footpath, near to the earthwork, which will have improved access and become one of the main Public Rights of Way within the local area. Currently, the bank has a poor presence within the local area on the southern side of The Haven. It is unlikely that public appreciation of the bank is significant, and a display board would be able to correct this. Similarly, any details on foreshore remains that are found and recorded as part of the project could be included within the public information board.

1.10.2 Any results from the archaeological investigations would also be made publicly available, through on-line dissemination of archaeological reports, or, dependant on the significance of the results, publication of the results in a regional journal (see **Section 1.12** below). Similarly, dependant on the level of interest in the results, public outreach can be undertaken, with the Archaeological Coordinator/Retained Archaeologist or the appointed archaeological sub-contractor undertaking presentations for interested local groups.

1.10.3 Requirements for heritage interpretation and publication will be determined following completion of the above work packages if warranted by the interest of the archaeological works and as agreed by the Applicant in consultation with the cultural heritage stakeholders.

1.11 Embedded Mitigation

1.11.1 Mitigating the effects to setting of heritage assets during the construction phase will be undertaken through standard construction work hours and practices being implemented, resulting in as limited an impact to the setting during construction as possible, lowering the impact significance due to limiting the period of time during the week where the effects of construction activity (noise and visual) would impede the assets.

1.11.2 The design of the Facility indicates that the structure's visual impact will be reduced through the use of standard profile cladding on external walls, with a muted colour palette.

1.11.3 All potentially odorous elements of the Facility's processes will be enclosed or contained, and Facility buildings will operate under negative pressure, reducing any impact by odour on the setting of any assets.

1.11.4 Lighting within the grounds of the Facility will be designed to a specification which will minimise the visual impact of the Facility during the evening and night, further details are provided within the **Outline Lighting Strategy** (document reference 7.5) that forms part of this application.

1.11.5 Best practice construction methodology will be applied to minimise noise during the construction phase, in accordance with British Standard (BS):5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites', see **Chapter 10 Noise and Vibration** of the ES (document reference 6.2.10) and the **Outline Code of Construction Practice** (document reference 7.1).

1.12 Post-fieldwork Assessment, Reporting and Archive

1.12.1 Each package of archaeological works will be accompanied by written reports pursuant to the requirements of those works and demonstrating appropriate planning, recording and data management and commitment to archiving and public dissemination of results.

1.12.2 For all aspects of recording, reporting, data management and archiving, the Applicant, their agents and archaeological contractors will adhere to standards and guidance for the relevant work package as set out in:

- CIfA (2014a) Standard and guidance for archaeological excavation;
- CIfA (2014b) Standard and guidance for archaeological field evaluation;

- CIfA (2014c) Standard and guidance for the collection, documentation, conservation and research of archaeological materials;
- CIfA (2014d) Standard and guidance for nautical archaeological recording and reconstruction; and
- CIfA (2020) Standard and guidance for an archaeological watching brief; and
- Historic England (2015a) Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record.

1.12.3 Each package of work will give rise to one or more archaeological reports, as set out in the method statement relating to the work. Each archaeological report will satisfy the method statement for the survey or investigation and will present the project information in sufficient detail to allow interpretation without recourse to the project archive. Reports will typically include:

- A non-technical summary;
- The aims and methods of the work;
- The results of the work including finds and environmental remains;
- A statement of the potential of the results;
- Proposals for further analysis and publication (if appropriate); and
- Illustrations and appendices to support the report.

1.12.4 Each archaeological report will be submitted in draft to the Archaeological Coordinator/Retained Archaeologist for submission to the Applicant. If the report is prepared by the Archaeological Coordinator/Retained Archaeologist, it will be submitted directly to the Applicant.

1.12.5 Decisions regarding the scope of post-fieldwork assessment will be made by agreement between the Applicant and the cultural heritage stakeholders following submission of investigation reports and based on the possible importance of the results in terms of their contribution to archaeological knowledge, understanding or methodological development.

1.12.6 The assessment phase may include (but is not limited to) the following elements:

- The conservation of appropriate materials, including the X-raying of metalwork;
- The spot-dating of all pottery from any investigation. This will be corroborated by the scanning of other categories of material;

- The preparation of site matrices with supporting lists of contexts by type, by spot-dated phase, and by structural grouping supported by appropriate scaled plans;
- An assessment statement will be prepared for each category of material, including reference to quantity, provenance, range and variety, condition and existence of other primary sources; and
- A statement of potential for each material category and for the data set, as a whole, will be prepared, including specific questions that can be answered and the potential value of the data to local, regional and national investigation priorities.

1.12.7 On the basis of recommendations made by the post-fieldwork assessment, and as agreed by the relevant cultural heritage stakeholders, mitigation requirements will be satisfied by carrying out analysis and reporting of the post-fieldwork assessment. If appropriate, this may include publication of important results in a recognised peer-reviewed journal or as a monograph.

1.12.8 It is accepted practice to keep project archives, including written, drawn, photographic and artefactual elements (together with a summary of the contents of the archive) together wherever possible and to deposit them in appropriate receiving institutions once their contents are in the public domain. Archives will be developed in line with guidance including:

- Brown (2007), Archaeological Archives a Guide to Best Practice in Creation, Compilation, Transfer and Curation;
- CIfA (2014e) Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives;
- Historic England's Management of Archaeological Projects (2015b);
- Institute of Conservation (1984) Environmental Guidelines for the Permanent Storage of Excavated Material from Archaeological Sites; and
- Walker (1990) Guidelines for the preparation of excavation archives for long-term storage.

1.12.9 The relevant cultural heritage stakeholders and the Archaeological Contractor will agree with the receiving institution a policy for the selection, retention and disposal of excavated material, and confirm requirements in respect of the format, presentation and packaging of archive records and materials, and will notify the receiving institution in advance of any fieldwork.

1.12.10 In England, the National Record of the Historic Environment (NRHE) is the repository for fieldwork records. The NRHE operates a policy for the selection of records relating to sites of national importance. The Applicant or their agents will produce an OASIS (Online Access to the Index of archaeological investigations) form for any completed and agreed archaeological reports produced as a result of this WSI and ensure that a copy is submitted as a PDF file to Historic England's NRHE.

1.13 Monitoring of Work

1.13.1 Having agreed the work package specific WSIs (method statements), the Archaeological Coordinator/Retained Archaeologist will inform the cultural heritage stakeholders, as required, of the proposed commencement dates of fieldwork for each survey / investigation type, and thereafter provide regular updates on the progress of the surveys. Reasonable and regular access to the site will be arranged for representatives of Heritage Lincolnshire, LCC HET and Historic England, as appropriate, for inspection and monitoring visits. These will be accompanied by the Archaeological Coordinator/Retained Archaeologist and/or the Archaeological Contractor.

1.14 Health and Safety

1.14.1 Health and Safety considerations will be of paramount importance in conducting all archaeological fieldwork. Safe working practices will override archaeological considerations at all times.

1.14.2 All work will be carried out in accordance with the Health and Safety at Work Act 1974 and the Management of Health and Safety Regulations 1992, as well as all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

1.14.3 The Archaeological Contractor(s) will supply a copy of their Health and Safety Policy and a site and task specific health and safety focused Risk Assessment Method Statement (RAMS) document to the Applicant (and the Archaeological Coordinator/Retained Archaeologist) before the commencement of any fieldwork. The Risk Assessment will have been read and understood by all staff attending the site before any survey and investigation works commence.

1.14.4 Any environmental constraints will be highlighted, considered and managed both prior to any archaeological works commencing and during the survey and investigation works themselves.

1.15 References

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