Lynnsport 3: Land South of Front Way, King's Lynn, Norfolk

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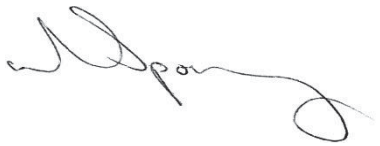
Signature:	

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Lynnsport 3: Land South of Front Way, King's Lynn, Norfolk

Archaeological Evaluation Report

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Summary

Oxford Archaeology (OA) carried out an archaeological evaluation between 9th and 11th April 2018 at Lynnsport 3: Land South of Front Way, King's Lynn, Norfolk. This work was commissioned by Lovell Partnerships Ltd. The site comprised 1.47ha of undeveloped land, within the urban reach of King's Lynn, proposed for residential redevelopment.

The current site constitutes the second evaluated area within a wider scope of works (Lynnsport 1-5) scheduled to be investigated by Oxford Archaeology. These works lie in a significant area of industrial archaeological remains relating to later Saxon and medieval salt-making.

Norfolk Heritage Environment Record (NHER) data indicated that the remains of a saltern mound (NHER 27910) partially lay within the bounds of the proposed development. This mound lay at the northwestern extremity of the site where it extends westwards into neighbouring allotment gardens. Within the site, this mound lay beneath a car park, still in use when the trenching investigation was carried out, where two boreholes were drilled by hand to confirm the presence/absence of salt-making deposits. These boreholes along with an evaluation trench placed on the southeastern edge of the mound (outside the car park's extent) confirmed the presence of the saltern.

The mound was found to be composed of waste silts and sands resulting from the salt-making process. Waste deposits within the trench were observed to have been recently truncated, possibly as a result of the construction of the car park. The overlying dumps of made ground containing plastic, metal and ceramic debris. The boreholes within the car park encountered a greater level of preservation of similar waste silt deposits surviving up to 1m in thickness. However, there was no evidence within the trench or boreholes to confirm the presence of any *in-situ* features (brine boiling hearths or filtration units) directly associated with the salt-making process. Furthermore, no datable artefacts were recovered from the saltern along with a paucity of environmental remains.

The evaluation also revealed a recent boundary ditch that extended from north to south across the site. No finds were recovered from this feature. A further extensive area of recent truncation with associated made ground was observed in the northeastern part of the site. The broad linear earthwork along the southern boundary of the site was found to be comprised of recent made ground and was probably associated with the levelling of the adjacent sports fields. The remaining trenches were found to be devoid of archaeological remains, revealing only natural marshland deposits.

Acknowledgements

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The project was managed for Oxford Archaeology by Matthew Brudenell. The fieldwork was directed by Graeme Clarke, who was supported by Frances Wildmun and Francis Pitcher. Survey was carried out by Sarita Louzolo and the illustrations were produced by Séverine Bézie. Thank you to the teams of OA staff that cleaned and packaged the finds under the management of Natasha Dodwell, processed the environmental remains under the management of Rachel Fosberry, and prepared the archive under the management of Katherine Hamilton.

1 INTRODUCTION

1.1 Scope of work

1.1.1 Oxford Archaeology (OA) was commissioned by Lovel Partnerships Ltd to undertake a trial trench evaluation at the site of Lynnsport 3: Land South of Front Way, King's Lynn, Norfolk (TF 6313 2120; Fig. 1); an area of known later Saxon and medieval salt-working.

1.1.2 The work was undertaken as a condition of Planning Permission (planning ref. 16/00097/FM) to inform the Planning Authority in advance of a submission of a Planning Application. This document outlines how OA implemented the specified requirements.

1.2 Location, topography and geology

1.2.1 The site is located within the urban reach of King's Lynn, c. 1.5km east of the River Great Ouse (Fig. 1). The site covers 1.47ha on a flat area of ground at approximately 3m OD. The site is bounded by the Bawsey drain to the north (with residential development on Front Way beyond), recreation fields to the south and east, and allotment gardens beyond a public footpath to the west.

1.2.2 The underlying geology of the site comprises Jurassic Kimmeridge Clay Formation mudstone overlain by layers of clay and silt, which were deposited by tidal action during the Quaternary period. British Geological Survey borehole data from the site (TF 62900 20900 and TF 63060 20890) revealed a typical Flandrian sequence of deposits, with an amorphous peat horizon (1.60/1.88m-3.10/3.35m below the ground surface) overlain by saltmarsh deposits of brown fine-grained silts and sands of the Terrington Beds.

1.2.3 The investigations carried out by Oxford Archaeology in 2017 on the nearby Lynnsport 4 and 5 developments (to the southwest; Fig. 2) revealed natural saltmarsh deposits at a height of approximately 2m OD (Clarke 2017a-b).

1.3 Archaeological and historical background

1.3.1 The following sections summarise the data obtained from the Norfolk Historic Environment Record (NHER; Fig. 2), and the results of the previous phases of archaeological investigations on Lynnsport 4 and 5 to the southwest of the site (Clarke 2017a-b; OA East Reports 2059 and 2078; ENF 139746 and ENF141949).

1.3.2 Although the surrounding landscape provides evidence of prehistoric and Roman activity in the vicinity of the site (with stray finds of a Roman coin, c.350m to the northeast (NHER 11990), and a Late Neolithic/Early Bronze Age arrowhead c.380m to the southwest (NHER 5494)), much of this area was unsuitable for occupation during the later prehistoric and Romano-British periods, with any earlier traces of activity sealed beneath thick marine and freshwater Flandrian deposits (the arrowhead was recovered from a drain cutting these deposits). Whilst not discounting the importance of these deposits, and the potential buried prehistoric land surfaces/shore-lines they protect, the immediate archaeological significance of the area falls largely within the

Anglo-Saxon, medieval and post-medieval periods when the area was a saltmarsh environment.

1.3.3 Of particular significance are the traces of a former salt-making industry that flourished between the Anglo-Saxon and post-medieval periods around the Wash coastline. The remains of this industry are primarily revealed in the form of saltern mounds, some of which still survive as earthworks, or are visible as pale oval or floriform soilmarks. The mounds, which can be up to 200m across, were formed by the piling up of waste sand from salt filtration in the 'sand washing' or 'sleeching' process of salt extraction.

1.3.4 An extensive swathe of saltern mounds is recorded around North Lynn, first identified by the National Mapping Programme (NMP) survey (Albone *et al.* 2007, 116). These not only reflect the importance of the salt industry, but the location and progressive land reclamation along the Anglo-Saxon and medieval coast line. Until recently, most of the saltern mounds were thought to be medieval or later in origin, particularly the western examples towards the current line of the Great Ouse. However, radiocarbon dating from recent excavations immediately south of the site have revealed that some of the mounds in this area have a Middle Saxon origin, pushing the date of the salt industry in this landscape back by several hundred years (Clarke 2017a-b; Fig. 2, ENF139746 and ENF141949). Mid to Late Saxon radiocarbon dates were also achieved for a saltern excavated at Marsh Lane, *c*. 650m to the northeast (Fig. 2, NHER 27899; Clarke and Clarke forthcoming; Clarke 2016), demonstrating that this was not a one-off, but evidence of a developed Anglo-Saxon saltworking landscape.

1.3.5 Clay-lined pits, filtration units and brine boiling hearths of various forms were found at both these sites, with differences in the size and shape of these features possibly indicating changes in manner and scale of production over time.

1.3.6 A sense of the extent of this industry is revealed by the fact that most records in the NHER recorded within a 500m radius of the site, relate to saltern mounds or salt-making activity (e.g. NHER 5524, 27886, 27893-6, 27899-902, 27906-912 and 38265). Saltern mounds are recorded on the north, west and south of the site. Most significantly, a recorded saltern covers the far northwest corner of the site (NHER 27910). The mound is recorded from 1946 RAF vertical aerial photographs and is described as an irregular to sub-rounded mound with a maximum diameter of 58m (Plate 1). Only the eastern third of the mound lies within the site boundary.

1.3.7 The salt-making industry declined during the post-medieval period, however, several of the saltern mounds were put to other uses during this time, some being incorporated into the King's Lynn siege defences during the Civil War (e.g. NHER 13785, not illustrated). The subsequent drainage of the Fens during the 17th century exposed a large area of land in the environs of the site and made it available for cultivation and extended permanent grazing pastures.

1.3.8 The Inclosure award map of 1810 shows the site as a parcel of open farmland (Norfolk Records Office (NRO) BL14-41). The 1884 and 1904 Ordnance Survey maps indicate that the site remained unchanged and crossed by a meandering northwest-southeast aligned drain connecting to the Bawsey Drain. This remains visible, as does a structure in the far southeast corner of the site until 1974.

2 EVALUATION AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The project aims and objectives defined in the Written Scheme of Investigation (WSI; (Brudenell 2015) are as follows:

i. provide sufficient coverage and exposure to enable excavation to establish the approximate form, date and purpose of any archaeological deposits, together with extent, localised depth and quality of preservation. It will also examine the deeper, Flandrian sequence of deposits at the site;
ii. provide sufficient coverage and exposure to evaluate the likely impact of past land uses, and the possible presence of masking deposits;
iii. provide sufficient coverage and exposure to provide information to construct an appropriate archaeological conservation/mitigation strategy, dealing with preservation, the recording of archaeological deposits, working practices, timetables and order of cost; and
iv. set results in the local, regional, and national archaeological context.

Research frameworks

2.1.2 More broadly, the site investigation takes place within, and will contribute to the goals of Regional Research Frameworks relevant to this area.

• Research and Archaeology: A Framework for the Eastern counties: 2. Research Agenda and Strategy (Brown & Glazebrook 2000, East Anglian Archaeology Occasional Papers 8):

2.1.3 '(p27) *From the Middle Anglo-Saxon period onwards there is evidence of both urban and rural craft production and industry. Is there a relationship between the two? To what extent was urban production city-serving and rural production largely conducted by itinerant craftsmen?'*

2.1.4 '(p31) *The rich material culture of towns, often present in dense quantities, must continue to be assessed and the results analysed and synthesised in order to increase understanding of the economic foundations of towns. Research work must target: evidence for commercial and industrial activity; definition, specialisation, marketing and distribution of products; linkages between social and political development and economic activity; and communications between towns and with the hinterland*.'

2.1.5 '(p31) *Industrial output, either from craft industries or early modern large-scale processes, will affect the urban environment. The impact of the economy can therefore be explored by: examination of evidence for industrial zoning; study of the relationship of industrial and commercial sites to distribution routes; and correlation of evidence for status with product specialisation and output*.'

2.1.6 '(p31) *Within urban culture, as in the rural hinterland, the church with its organisation, its role in society and its economic power deserves special attention. The following areas of research need to be amplified:..... the economic influence of the church.'*

• Research and Archaeology Revisited: A Revised Framework for the East of England (Medlycott 2011, East Anglian Archaeology Occasional Papers 24):

2.1.7 '(p67) *The Norfolk Coast and Broads NMP projects recorded large numbers of saltern mounds within The Wash and, to a lesser extent, around Breydon Water and the former Great Estuary (Albone et al. 2007). This has made a significant contribution to the study of this important medieval industry, and represents the first comprehensive identification and analysis of such sites within the county. The recognition of evidence for the possible Late Saxon origins of some of the saltern mounds provides further evidence for the early development of this form of salt-making (i.e sand washing).*'

2.2 Methodology

2.2.1 In accordance with the WSI (Brudenell 2015) a total of 300m of linear trenching was excavated (Trenches 35-42), representing a 4% sample of the 1.47ha proposed development area. Seven trenches (Trenches 35-39 and 41-42) were proposed to be 40m long by 2m wide and one trench (Trench 40) was to be 20m long by 2m wide.

2.2.2 During the excavation Trench 35, targeted on the presumed saltern in the northwestern extremity of the site, was moved eastwards as the car park was found to still be in use.

2.2.3 Machine excavation was carried out under constant archaeological supervision with a 360º mechanical excavator using a 2m-wide toothless ditching bucket.

2.2.4 The site survey was carried out using a Leica GPS GS08 with SmartNET.

2.2.5 Spoil, exposed surfaces and features were scanned with a metal detector, however no metalwork was recovered from the evaluation.

2.2.6 All archaeological features and deposits were recorded using OA's pro-forma sheets. Trench locations, plans and sections were recorded at appropriate scales and digital SLR photographs were taken of all relevant features and deposits.

2.2.7 A total of two bulk samples were taken from the excavated deposits. These each totalled 20L and were processed by flotation at OA's environmental processing facility at Bourn.

2.2.8 Site conditions were good, with rain at times.

3 RESULTS

3.1 Introduction and presentation of results

3.1.1 Descriptions of the ground conditions encountered, features identified and artefacts recovered are presented below and described numerically by trench. As described above, this site forms part of a wider context of research into the salt-making landscape of Gaywood currently being undertaken for the Lynnsport development by OA (Brudenell and Clarke 2017). Salterns 1-4 were identified during an earlier phase of excavations at the Lynnsport 4 and 5 developments (Clarke 2017a-b; Fig. 2, ENF139746 and ENF141949). These wider investigations also encompass Salterns 5-8 identified by OA East on the neighbouring school development at Greenpark Avenue to the west (Clarke 2018; Fig. 2, ENF143325). Consequently, the salt-making deposits encountered on this site are described numerically as Saltern 9, with Salterns 1-8 lying wholly outside the current investigation area. Further context descriptions with dimensions are given in Appendix A; Table 2.

3.1.2 Figure 2 shows the location of the site in relation to the Norfolk Heritage Environment Records (NHER) for the area and other Lynnsport sites. Figure 3 provides an overall plan of the results of the evaluation, with selected sections of features and deposits given in Figure 4.

3.2 General soils and ground conditions

3.2.1 The underlying natural deposits (301) were found to be consistent with the descriptions given for natural saltmarsh deposits indicated on the BGS website (Section 1.2.2).

3.2.2 The overlying soil sequence within all trenches was fairly uniform. The natural geology was overlain by a post-medieval subsoil (304), which in turn was overlain by topsoil/ploughsoil (305).

Deposit model for the site (Fig. 4)

3.2.3 The deposits revealed during the borehole and trenching investigations have been grouped into ten units, described stratigraphically below:

- **Group 301**: Natural tidal flat deposits underlying the saltern mounds;
- **Group 302**: Saltern 9, salt-making deposits;
- **Group 303**: Saltern 9, recently disturbed salt-making deposits;
- **Group 304**: Subsoil;
- **Group 305**: Topsoil;
- **Group 306**: Made ground overlying the truncation of Saltern 9 deposits observed in Trench 35;
- **Group 307**: Modern truncation cutting Saltern 9 deposits observed in Trench 35;

- **Group 308**: Made ground overlying the truncation of the pre-existing land surface observed in the northeastern part of the site, encompassing Trenches 38-40;
- **Group 309**: Modern truncation of the pre-existing land surface across the northeastern part of the site, encompassing Trenches 38-40; and
- **Group 310**: Made ground making up the broad linear earthwork extending along the southern boundary of the site.

3.2.4 Ground conditions throughout the evaluation were generally wet, with the lower lying trenches (outside/beyond Saltern 9) submerged with water. However, archaeological features, where present, were easy to identify against the underlying natural geology.

3.3 General distribution of archaeological deposits

3.3.1 Figure 3 provides an overall plan of the results of the investigations. The evaluation revealed the remains of a saltern mound (Saltern 9) within Trench 35. The mound was composed of deposits derived from silt filtration processes indicative of the salt-making industry of the area during the Late Saxon/ early medieval period. However, no datable artefacts were recovered from these deposits and no *in-situ* remains of silt filtration units that would have produced these deposits were encountered within the trench. The saltern mound appeared to extend mainly beneath the current car park, precluding the excavation of Trench 35 in its original location. Consequently, two boreholes were excavated on grass verges of the car park which confirmed silt filtration deposits up to 1.3m thick were present. Combined, the trench and boreholes indicate that the formation of Saltern 9 commenced over the natural saltmarsh at a height of between 1.57m and 2m OD.

3.3.2 A ditch (**311**) was also revealed on a north-south orientation, cutting the natural deposits in Trenches 37 and 41. No datable artefacts were recovered from this feature, which probably represents a minor internal division of the plot of open land, broadly corresponding to the current perimeter of the site, shown on historical maps dating from 1810 (see Section 1.3.8).

3.3.3 In addition to these remains, an area of modern truncation was identified encompassing the area of Trenches 38-40 (Plate 2). Furthermore, the broad linear earthwork along the southern boundary of the site was found to be comprised of recent made ground and probably associated with the levelling of the adjacent sports fields.

3.4 Borehole results

3.4.1 Two boreholes were drilled by OA East (WS13 and WS14; Fig. 3) using a hand-augur into Saltern 9 to determine the extent of the salt-making deposits beneath the footprint of the car park (Plate 3).

3.4.2 Borehole WS13 was drilled at a height of 3.25m OD (Plate 4). The water table was encountered at a height of 1.75m OD.

- 0-0.3m below ground level (bgl): soft dark grey fine sandy silt with occasional flint gravel (Group 305)

- 0.3-0.6m bgl: soft mid orange brown fine sandy silt (Group 304)
- 0.6-1.1m bgl: soft light orange brown fine sandy silt (Group 302)
- 1.1-1.5m bgl: loose orange brown silty fine sand (Group 302)
- 1.5-1.8m bgl: soft greyish brown silt (Group 301)
- 1.8m+ bgl: grey fine sandy silt with organic macrofossils (Group 301)

3.4.3 Borehole WS14 was drilled at a height of 3.27m OD. The watertable was encountered at a height of 1.67m OD.

- 0-0.1m bgl: soft dark grey fine sandy silt with occasional flint gravel (Group 305)
- 0.1-0.4m bgl: soft mid orange brown fine sandy silt (Group 304)
- 0.4-1.3m bgl: soft light orange brown fine sandy silt (Group 302)
- 1.3-1.7m bgl: loose orange brown silty fine sand (Group 302)
- 1.7-2.1m bgl: soft greyish brown silt (Group 301)
- 2.1m+ bgl: grey fine sandy silt with organic macrofossils (Group 301)

3.5 Trench results

3.5.1 A total of eight trenches were excavated on the site (Fig. 3; Table 1). Trenches 36, 39 and 40 were devoid of archaeological features and found to be located over the natural saltmarsh deposits of Group 301.

Trench number	Length (m)	Average topsoil depth (m)	Average subsoil depth (m)	Archaeological summary	Finds
35	40	-	-	Later Saxon/early medieval Saltern 9 (deposits 302 & 303). Modern truncation **307** overlain by made ground 306.	(303) 19th century pottery sherds (306) modern refuse (not retained)
36	40	0.35	0.25	No archaeology	None
37	40	0.3	0.3	Modern boundary ditch **311**	None
38	40	-	-	Modern truncation **309** overlain by made ground 308.	(308) modern refuse (not retained)
39	40	-	-	No archaeology	None
40	40	-	-	No archaeology	None
41	40	0.4	0.3	Modern boundary ditch **313**	None

Trench number	Length (m)	Average topsoil depth (m)	Average subsoil depth (m)	Archaeological summary	Finds
42	40	-	-	Broad linear earthwork composed of recent made ground	(310) modern refuse (not retained)

Table 1: Summary trench descriptions

Trench 35 (Plate 5)

3.5.2 In the northwestern part of the site, Trench 35 revealed a low mound of loose brownish yellow sandy silt (302) extending across its northern part, overlying natural saltmarsh deposits (301; Fig. 4, Section 112). This deposit, up to 0.5m thick, was probably derived from silt filtration activity, as part of the salt-making process, during the later Saxon/early medieval period. As indicated by the NHER, this deposit probably formed part of the saltern (NHER 27910) known to extend north-westwards from the trench to the current car parking area investigated by boreholes WS13 and WS14 (see Section 3.4). No finds were recovered from this deposit. It was overlain by a *c*.0.2m thick layer of firm dark bluish grey sandy silt (303) that contained two sherds (34g) of 19th century pottery. This deposit probably represents recent disturbance of the saltern deposits (Plate 6).

3.5.3 This mound of salt-making deposits was found to be truncated in this trench at a height of *c*.2.5m OD (**307**) above which was a layer of modern material that consisted of firm dark greyish brown clayey silt (306) that contained fragments of concrete, plastic, metal and textile (Fig. 4, Section 111).

Trench 36

3.5.4 Located to the east of Trench 35, this trench revealed a similar sequence in section (not illustrated) whereby the pre-existing land surface and underlying natural deposits had been truncated (**309**) at the eastern end to a depth of 0.86m below ground level. This truncation level was overlain by firm dark greyish brown clayey silt that contained fragments of concrete, plastic, metal and textile (308). The recent truncation and overlying deposit extended eastwards and southwards towards Trenches 38-40 (see below).

Trench 37 (Plate 7)

3.5.5 Located to the south of Trench 35, this trench revealed a shallow boundary or drainage ditch (**311**), that cut the natural marsh deposits, on a north-south alignment (Fig. 4, Section 113). It measured 1m wide and 0.15m deep with a shallow U-shaped profile. The fill (312) consisted of loose light greyish brown silty sand.

Trenches 38-40

3.5.6 In the northeastern part of the site, Trench 38 (Plate 7) revealed the eastward continuation of recent truncation of the pre-existing land surface and underlying natural deposits seen in Trench 36 (**309**). The truncation in this part of the site was observed to reach depths of between 0.6-1m below ground level. The truncation level

was overlain by layers of modern material consisting of limestone and brick hardcore along with layers of firm dark greyish brown clayey silt that contained fragments of concrete, plastic, metal and textile (308). This zone of truncation was observed to extend southwards to encompass the northern part of Trench 39 and the full extent of Trench 40 where it reached depths of between 0.5-0.7m below ground level.

Trench 41 (Plate 8)

3.5.7 Located to the west of Trench 35, this trench revealed the southwards continuation of the north-south aligned ditch (**311**) uncovered by Trench 37. The ditch (**313**) was found to be of the same dimensions and contain the same fill (314) as that described for ditch **311** (see above).

Trench 42 (Plate 9)

3.5.8 To the south of Trench 41, Trench 42 was placed over a broad linear earthwork that extended along the southern boundary of the site. The trench revealed the earthwork to be a build-up of recent made ground (310), greater than 1m thick, that consisted of firm dark greyish brown clayey silt that contained fragments of concrete, plastic, metal and textile (308).

3.6 Finds summary

Pottery (Appendix B.1)

3.6.1 Two 19th century sherds (34g) of pottery were recovered from deposit 303, associated with Saltern 9. These fragments of domestic kitchenware and redware vessels have not been affected by salt and there is no definitive link between the pottery and the saltern. The pottery may relate to rubbish deposition from nearby occupation and suggests the upper layers of the saltern have been disturbed recently.

3.7 Environmental summary

Environmental samples (Appendix C.1)

3.7.1 Two bulk samples were taken from salt-making deposit composing Saltern 9 and the modern ditch fill. Preservation of plant remains was poor. Foraminifera are not present in either sample. Therefore, the filtration waste silt deposit comprising Saltern 9 is considered to have low environmental potential.

4 DISCUSSION

4.1 Reliability of field investigation

4.1.1 The archaeological features and deposits were clearly visible within the evaluation trenches. The natural geological horizon (beneath the topsoil, subsoil and recent made ground overburden) on which the salt-making deposits lay and into which the boundary ditch was cut was also clearly identifiable. However, the ditch that lay outside the footprints of the saltern mound was prone to flooding, causing standing water to be present in all of the lower lying trenches, although this did not hamper the investigation.

4.1.2 Therefore, the results of the evaluation trenching are considered to have a good level of reliability.

4.2 Evaluation objectives and results

4.2.1 The project aims and objectives defined in the WSI (Brudenell 2015) and listed in Section 2.1 are included below with summary statements outlining the remains encountered on the site and how these help in achieving these objectives.

Provide sufficient coverage and exposure to enable excavation to establish the approximate form, date and purpose of any archaeological deposits, together with extent, localised depth and quality of preservation. Trenching will also examine the deeper, Flandrian sequence of deposits at the site.

Provide sufficient coverage and exposure to evaluate the likely impact of past land uses, and the possible presence of masking deposits.

4.2.2 The borehole survey demonstrated the basal horizon of the mound in the northwestern extremity of the site (NHER 27910) commenced on the saltmarsh at a height of between *c*.1.57-2m OD, lower than the *c*.2m OD horizons encountered on the salterns to the southwest within the Lynnsport 4 and 5 developments (Clarke 2017a-b). The brownish yellow sandy silt (302) revealed by the borehole and trenching investigation comprising the mound make-up is considered typical of waste silts produced by 'sleeching'. This was the sand washing process employed during the later Saxon and medieval periods for the stripping of muds collected from the intertidal zone (to the west) of their salt content for the production of concentrated brine. This activity was carried out in clay-lined tanks known as filtration units. Although no evidence for clay-lined tanks was uncovered by Trench 35 or the boreholes into Saltern 9, examples of features belonging to this period, along with dumps of their associated waste silts, have been found on the recent excavations into nearby saltern mounds. (Lynnsport 4 and 5, Clarke 2017a-b; Marsh Lane, Clarke 2016; Former Mary's Nursing Home in King's Lynn, Cope-Faulkner 2014). Perhaps significantly, there was a complete absence of any layers of burnt deposits containing fragments of fired clay and charcoal. These distinctive deposits are usually found along with the 'sleeching' remains that constitute saltern mounds and are indicative of the presence of brine boiling hearths.

4.2.3 No datable artefacts were recovered from the undisturbed salt-making deposit (302). The paucity of artefactual remains is considered to be typical of these salt-making sites. For example, the excavations into the salterns within the Lynnsport 4 and 5

developments only produced a handful of Late Saxon pottery sherds (Clarke 2017b). Furthermore, the lack of any later artefacts from the current site also suggests that Saltern 9 may be of broadly contemporary date.

4.2.4 The saltern would have lain on the saltmarsh, close to the intertidal zone to exploit the salt-rich estuarine muds. This landscape pre-dated the diversion of the Great Ouse to King's Lynn in the 13th century, when the local coastal environment in the vicinity of Bishop's (King's) Lynn was fed by a series of smaller rivers such as the Old Wiggenhall Eau, the Nar and Gaywood rivers. Documentary evidence demonstrates that prior to the River Gaywood's diversion along the southern margins of the historical North Marsh in 1425, it flowed through the marsh's central part (close-by to the north of the site) where it was known as 'le Seadyck' (NRO reference BL 55/1). The course of the Bawsey drain, bordering the north of the site, that broadly follows the old course of the river, is indicated on historic OS maps as far back 1885 but is absent from the tithe map of 1838 (NRO DN-TA137).

4.2.5 No evidence for channels or creeks were identified in any of the trenches. The ditch running directly north to south across the site is considered to probably represent a minor internal division of the plot of open farmland, corresponding broadly with the current perimeter of the site, shown on historic mapping dating back to 1810 (see Section 1.3.8).

Provide sufficient coverage and exposure to provide information to construct an appropriate archaeological conservation/mitigation strategy, dealing with preservation, the recording of archaeological deposits, working practices, timetables and order of cost.

4.2.6 Saltern 9 was observed to extend westwards from Trench 35 as a broad mound across the full extent of the car parking area, in the northwestern extremity of the site. As stated above, the boreholes indicated the basal horizon of Saltern 9 to lie at a height of between *c*.1.57-2m OD. Recent truncation of the saltern appears to have been significant in places with the section of Trench 35 displaying a line of modern truncation at a height *c*.2.5m OD. However, the boreholes within the car parking area to the west of Trench 35 revealed undisturbed filtration waste silts were present immediately beneath the base of the topsoil/subsoil horizon to a maximum height of between 2.65-2.87m OD. Therefore, depending on the formation level for the substrate of the car park, undisturbed salt-making deposits may survive between *c*.0.5-1.3m thick comprising Saltern 9, across an area of *c*.0.3ha.

Set results in the local, regional, and national archaeological context.

Research frameworks

4.2.7 As the summary statements above demonstrate, the evaluation has confirmed the presence of the purported salt-making site (NHER 27910; Saltern 9) within the current development. Furthermore, the identification of Saltern 9 adds to the growing corpus of salt-making remains in the area with a high potential to help address the research aims stated in the regional research frameworks (see Section 2.1.3-7).

4.2.8 In particular regarding Section 2.1.6-7, the potential of the present site lies in its incorporation within the wider study into later Saxon and medieval salt-making

currently being investigated as part of the Lynnsport residential developments (Fig. 2, Lynnsport 1-5). These excavations, when taken as a whole, provide a unique opportunity to study a substantial proportion of the salt-making sites on the historical North Marsh of Gaywood. These sites are documented to have been part of the ecclesiastical lordship of Gaywood, held as part of an Episcopal See from at least the Late Saxon period (successively the East Anglian Bishops of North Elmham, Thetford and Norwich; Little Domesday Book of *c*.1086, NRO reference E 31/1/2/1051).

4.3 Interpretation

Later Saxon/early medieval salt-making remains

4.3.1 The evaluation revealed evidence for salt-making on the site in the form of a single mound of deposits comprising Saltern 9, that extend beneath the current car parking area in the northwestern extremity of the site. The mound appeared to be constituted solely of waste filtration silts from 'sleeching' as part of the salt-making process. However, no evidence for any of the clay-lined water tanks that produced this waste was uncovered by the evaluation. These waste silts are considered to be typical of the known later Saxon/early medieval salt-making remains previously excavated in the area (Clarke 2016, Clarke 2017a-b, Clarke 2018).

4.3.2 A ditch was also revealed that probably represents a minor internal division of the open plot of land as far back as at least 1810 (NRO BL14-41).

4.4 Significance

4.4.1 The evaluation confirmed the presence of the purported saltern mound indicated by the NHER (NHER 27910) located in the northwestern extremity of the site; an area of the site currently used as a car park. Although undated, the salt-making deposits representing this saltern probably date from the later Saxon/early medieval period.

4.5 Recommendations

4.5.1 Recommendations for any future work based upon this report will be made by the County Archaeology Office.

APPENDIX A CONTEXT INVENTORY

Context	Cut	Trench	Category	Feature Type	Function	Colour	Fine component	Coarse component	Compaction	Breadth	Depth	Shape in Plan	Profile	Period
301		-	layer	natural	saltmarsh deposit	light brownish grey	silt	none	soft					natural
302		35	layer	Saltern 9	filtration waste	brownish yellow	sandy silt		soft		0.5			later Saxon/early medieval
303		35	layer	Saltern 9	filtration waste	dark bluish grey	sandy silt		firm		0.2			later Saxon/early medieval
304		-	layer	topsoil	-	light brown	clayey silt	none	soft					modern
305		-	layer	subsoil	-	dark greyish brown	silt	none	soft					modern
306		35	layer	modern deposit	made ground	dark greyish brown	clayey silt	concrete, plastic, metal and textile fragments	firm		0.8			modern
307		35	cut	modern truncation	?									modern
308		38-40	layer	modern deposit	made ground						1			modern
309		38-40	cut	modern truncation	?	dark greyish brown	clayey silt	CBM, concrete, plastic, metal and textile fragments	firm					modern
310		42	layer	earthwork	bund of made ground	dark greyish brown	clayey silt	CBM, concrete, plastic, metal and textile fragments	firm		<1			modern

Context	Cut	Trench	Category	Feature Type	Function	Colour	Fine component	Coarse component	Compaction	Breadth	Depth	Shape in Plan	Profile	Period
311	311	37	cut	ditch	boundary					1	0.15	linear	U-shaped	modern
312	311	37	fill	ditch	silting	light greyish brown	silty sand	none	Loose					modern
313	313	41	cut	ditch	boundary					0.9	0.12	linear	U-shaped	modern
314	313	41	fill	ditch	disuse	light greyish brown	silty sand	none	loose	0.9	0.12			modern

Table 2: Context inventory

APPENDIX B FINDS REPORTS

B.1 Pottery

By Carole Fletcher

Introduction

B.1.1 Archaeological works produced a small assemblage of pottery, recovered from layer 303, associated with Saltern 9.

Methodology

B.1.2 The Prehistoric Ceramics Research Group (PCRG), Study Group for Roman Pottery (SGRP), The Medieval Pottery Research Group (MPRG), 2016 *A Standard for Pottery Studies in Archaeology* and the MPRG *A guide to the classification of medieval ceramic forms* (MPRG 1998) act as standards.

B.1.3 Recording was carried out using OA East's in-house system, based on that previously used at the Museum of London. Fabric classification has been carried out for all sherds, and post-medieval types named, using the Museum of London fabric codes where possible (MoLA 2014). All sherds have been counted, classified and weighed on a context-by-context basis. The assemblage is recorded in the text of this report. The pottery and archive are curated by Oxford Archaeology East until formal deposition or dispersal.

Assemblage

B.1.4 Two 19th century sherds were recovered from layer 303, possibly associated with Saltern 9. The larger sherd is a relatively obtuse base angle and wall fragment from a late slipped kitchenware bowl (0.031kg); much of the internal cream slip and clear glaze has been lost, otherwise the sherd is unabraded. The second sherd (0.003kg) is a refined redware of an unknown form, externally and internally (clear) glazed.

Discussion

B.1.5 The small and fragmentary assemblage of pottery may be domestic in origin, dating to the 19th century. None of the pottery recovered has been affected by salt and there is no definitive link between the pottery and the salterns found on the site. The pottery may relate to rubbish deposition from nearby occupation and suggests the upper layers of the saltern waste has been disturbed.

Retention, dispersal and display

B.1.6 If further work is undertaken, more pottery may be recovered, however, probably only at low levels. Due to the fragmentary nature of the assemblage, it is of little significance, beyond indicating later disturbance of the saltern mounds. Should further work be undertaken, the pottery should be incorporated into any later archive. If no

further work on the site is undertaken, this report acts as a full record and the pottery may be deselected prior to archival deposition.

APPENDIX C ENVIRONMENTAL REPORTS

C.1 Environmental Samples

By Rachel Fosberry

Introduction

C.1.1 Two bulk samples were taken from a salt-making deposit composing Saltern 9 and a modern ditch fill on the site in order to assess the quality of preservation of plant remains and their potential to provide useful data as part of further archaeological investigations.

Methodology

C.1.2 Each of the samples was processed by tank flotation using modified Siraff-type equipment for the recovery of charred plant remains, dating evidence and any other artefactual evidence that might be present. The floating component (flot) of the samples was collected in a 0.3mm nylon mesh and the residue was washed through 10mm, 5mm, 2mm and a 0.5mm sieve. A magnet was dragged through each residue fraction for the recovery of magnetic residues prior to sorting for artefacts. Any artefacts present were noted and reintegrated with the hand-excavated finds. The dried flots were subsequently sorted using a binocular microscope at magnifications up to x 60. Identification of plant remains is with reference to the Digital Seed Atlas of the Netherlands (Cappers *et al.* 2006) and the authors' own reference collection. Nomenclature is according to Stace (2010).

Results

C.1.3 Preservation of plant remains is poor.

C.1.4 Foraminifera are not present in either sample.

C.1.5 Sample 201 from filtration waste silt 302 of Saltern 9 produced a small flot (1ml) that contained occasional small fragments of coal, ostracods and an untransformed elderberry (*Sambucus nigra*) seed.

C.1.6 Sample 200 from the modern boundary ditch **311** (312) also produced a small flot (2ml) containing occasional ostracods and a single seed of duckweed (*Lemna* sp.) signifying that the deposit was waterlogged.

Discussion

C.1.7 The filtration waste silt deposit comprising Saltern 9 is considered to have low environmental potential.

APPENDIX D BIBLIOGRAPHY

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Historic England	2011	*Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (2nd edition),* Centre for Archaeology Guidelines
Historic England	2015	*Management of Research Projects in the Historic Environment, The MoRPHE Project Managers' Guide*
Medieval Pottery Research Group	1998	*A Guide to the Classification of Medieval Ceramic Forms.* Medieval Pottery Research Group Occasional Paper I
Medlycott, M.	2011	*Archaeology Revisited: a revised framework for the East of England, East Anglian Archaeological Occasional Papers 24* (EAA 24)
PCRG SGRP MPRG	2016	*A Standard for Pottery Studies in Archaeology.*
Stace, C.	2010	*New Flora of the British Isles. Third edition.* Cambridge University Press

Norfolk Records Office

E 31/1/2/1051	*c.*1086	191r Little Domesday Book, Gaywood, Norfolk
DN-TA137	1838	Gaywood tithe map
BL 55/1	Feb. 1914	Bradfer-Lawrence Collection. Maps and Plans. Sketch of Gaywood as in 1488
BL14-41	1810	Bradfer-Lawrence collection. Inclosure award

Electronic sources

Museum of London Archaeology, 2014 Medieval and post-medieval pottery codes. www.mola.org.uk/medieval-and-post-medieval-pottery-codes consulted 13/04/2018

APPENDIX E OASIS REPORT FORM

Project Details

OASIS Number	Oxfordar3-215427
Project Name	Lynnsport 3: Land South of Front Way, King's Lynn, Norfolk

Start of Fieldwork	09/04/18	End of Fieldwork	11/04/18
Previous Work	No	Future Work	Yes

Project Reference Codes

Site Code	XNFFWY18	Planning App. No.	16/00097/FM
HER Number	ENF138254	Related Numbers	NWHCM2018.155

Prompt	Direction from Local Planning Authority – PPS 5
Development Type	Urban residential
Place in Planning Process	After full determination (eg. As a condition)

Techniques used (tick all that apply)

☐	Aerial Photography – interpretation	☐	Grab-sampling	☐	Remote Operated Vehicle Survey
☐	Aerial Photography - new	☐	Gravity-core	☐	Sample Trenches
☐	Annotated Sketch	☐	Laser Scanning	☐	Survey/Recording of Fabric/Structure
☐	Augering	☐	Measured Survey	☒	Targeted Trenches
☐	Dendrochonological Survey	☒	Metal Detectors	☐	Test Pits
☐	Documentary Search	☐	Phosphate Survey	☐	Topographic Survey
☒	Environmental Sampling	☐	Photogrammetric Survey	☐	Vibro-core
☐	Fieldwalking	☐	Photographic Survey	☐	Visual Inspection (Initial Site Visit)
☐	Geophysical Survey	☐	Rectified Photography		

Monument	Period
saltern	Early Medieval (410 to 1066)
saltern	Medieval (1066 to 1540)
Drainage ditch	Post Medieval (1540 to 1901)

Object	Period
Fired clay and lead item	Early Medieval (410 to 1066)
Fired clay, fuel ash slag and brick	Medieval (1066 to 1540)
Pottery, CBM and animal bone	Post Medieval (1540 to 1901)

Project Location

County	Norfolk
District	King's Lynn and West Norfolk
Parish	North Lynn
HER office	Norfolk
Size of Study Area	3.8 ha
National Grid Ref	TF 6313 2120

Address (including Postcode)

Land south of Front Way, King's Lynn, Norfolk, PE30 2LU

Project Originators

Organisation	OA East
Project Brief Originator	James Albone (NCC/HES)
Project Design Originator	Dr Matthew Brudenell (OA East)
Project Manager	Dr Matthew Brudenell (OA East)
Project Supervisor	Graeme Clarke (OA East)

Project Archives

	Location	ID
Physical Archive (Finds)	Norwich Castle Museum	NWHCM2018.155
Digital Archive	Norwich Castle Museum	NWHCM2018.155
Paper Archive	Norwich Castle Museum	NWHCM2018.155

Physical Contents	Present?	Digital files associated with Finds	Paperwork associated with Finds
Animal Bones	☒	☒	☒
Ceramics	☒	☒	☒
Environmental	☒	☒	☒
Glass	☐	☐	☐
Human Remains	☐	☐	☐
Industrial	☒	☒	☒
Leather	☐	☐	☐
Metal	☐	☐	☐
Stratigraphic		☐	☒
Survey		☒	☒
Textiles	☐	☐	☐
Wood	☐	☐	☐
Worked Bone	☐	☐	☐
Worked Stone/Lithic	☐	☐	☐
None	☐	☐	☐
Other	☐	☐	☐

Digital Media		Paper Media	
Database	☒	Aerial Photos	☐
GIS	☒	Context Sheets	☒
Geophysics	☐	Correspondence	☐
Images (Digital photos)	☒	Diary	☐
Illustrations (Figures/Plates)	☒	Drawing	☐
Moving Image	☐	Manuscript	☐
Spreadsheets	☐	Map	☐
Survey	☒	Matrices	☒
Text	☒	Microfiche	☐
Virtual Reality	☐	Miscellaneous	☒
		Research/Notes	☒
		Photos (negatives/prints/slides)	☒
		Plans	☒
		Report	☒
		Sections	☒
		Survey	☒

Further Comments

APPENDIX F WRITTEN SCHEME OF INVESTIGATION

Oxford Archaeology East
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Cambridgeshire CB23 8SQ
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Written Scheme of Investigation
Archaeological Evaluation

Site name	**Land south of Front Way, King's Lynn (Lynn Sport 3)**
Site code	**XNFFWY15**
Location	**TF 6313 2120**
Project number	17308
Project type	Evaluation
Event number	ENF138254
Oasis number	oxfordar3-210763
Planning Application No.	Pre application
Client	Lovell
Date	17 June 2015
Author	Dr Matthew Brudenell

TABLE OF CONTENTS

1. General background

This Written Scheme of Investigation (WSI) conforms to the principles identified in English Heritage's guidance documents 'Management of Research Projects in the Historic Environment', specifically the MoRPHE Project Manager's Guide (2006) and PPN3 (Project Planning Note 3): Archaeological Excavation.

All work will be conducted to professional standards, and will be executed in line with appropriate section of Gurney, D. 2003. 'Standard for Field Archaeology in the East of England', as adopted by the Association of Local Government Archaeological Officers for the East of England Region and published as 'East Anglian Archaeology Occasional Paper 14'.

1.1. Circumstances of the project

Oxford Archaeology East (OA East) have been commissioned by Lovell to undertake a programme of archaeological evaluation on land south of Front Way, King's Lynn, known as Lynn Sport 3.

The requirements for the evaluation have been discussed with the Planning Archaeologist James Albone of Norfolk County Council Historic Environment Service, who has informed OA East that King's Lynn and West Norfolk Borough Council will be advised that any planning permission granted should be subject to pre-commencement archaeological conditions to investigate, record and advance understanding of heritage assets before they are damaged for destroyed.

The development will comprise the construction of residential dwellings, access roads and landscaping (see attached plan).

1.2. Location, geology and topography of the site

The site is located within the urban reach of King's Lynn, c. 1.8km east of the River Great Ouse. It falls within a wider plot of land currently used as a sports field, with a parking area at the north-west corner of the plot. The sit is bounded by the Bawsey Drain to the north, allotments to the west, and an area of trees to the south. The eastern boundary of the development land cuts across the sports field, but will abut the edge of a new highway considered under a separate planning application. The site covers 1.47ha, of which 1.2ha is suitable for trial trenching. Land which cannot be trenched includes the 9m wide easement area from the edge of Bawsey Drain, the line of the mains sewer at the western edge of the site which requires a stand-off, and the existing tree belt in the southern half of the site which is to be retained (see attached plan).

The underlying geology of the site comprises Jurassic Kimmeridge Clay Formation mudstone overlain by layers of clay and silt, which were deposited by tidal action during the Quaternary period. British Geological Survey borehole data from site (TF 6308 2126) revealed a typical Flandrian sequence of deposits, with an amorphous peat horizon (2.10m-3.75m below the ground surface) overlain by saltmarsh deposits of brown fine-grained silts and sands of the Terrington Beds.

The site is situated on a flat area of ground at approximately 3m AOD

2. Archaeological background

Although the surrounding landscape provides evidence of Prehistoric and Roman activity in the vicinity of the site (with stray finds of Roman coins, pottery, and a Neolithic polished axe recorded (NHER 5491, 11990 and 22955)), much of this area was unsuitable for occupation during later Prehistory and the Romano-British period, with any earlier traces of activity sealed beneath thick marine and freshwater Flandrian deposits. Whilst not discounting the importance of these deposits, and the potential buried Prehistoric land surfaces/shore-lines they protect, the immediate archaeological significance of the area falls largely within Medieval and Post-Medieval periods when the area was a saltmarsh environment.

Of particular significance to this area are Medieval and early Post-Medieval saltern mounds, some of which still survive as earthworks, or are visible as pale oval or floriform soilmarks. The mounds, which can be up to 200m across, were formed by the piling up of waste sand from salt filtration in the 'sand washing' process of salt extraction. An extensive swathe of saltern mounds are recorded at North Lynn. These not only reflect the importance of the Medieval salt industry at Lynn, but the location and progressive land reclamation along the Medieval coast line, with the easterly inland examples postulated as being the earliest in the sequence (westerly migration occurring as sites were gradually abandoned in favour of locations further out in the channel as the estuary of the Great Ouse silted and the coastline changed).

Of the 35 records in the Norfolk Historic Environmental Record recorded with a 500m radius of the site, 20 relate to saltern mounds or salt making activity (e.g. NHER 5524, 27886, 27893-6, 27899-902, 27906-912 and 38265). The mounds are recorded to the north, south and west. Most significantly, a recorded saltern covers the far north-west corner of the site (NHER 27910). The mound is recorded from 1947 RAF vertical aerial photographs and is described as an irregular to sub-rounded mound with a maximum diameter of 58m. Only the eastern third of the mound is within the site boundary.

The salt making industry declined during the post-medieval period, however, several of the saltern mounds were put to other uses during this time, often associated with the siege of King's Lynn during the Civil War (e.g NHER 13785). The subsequent drainage of the Fens during the 17th century exposed a large area of land in the environs of the site and made it available for cultivation. Remnant ridge and furrow or 'lazybedding' agricultural features are recorded immediately south of the site in the adjacent field (NHER 27890), with further examples further south (NHER 27865). Earthworks of possible medieval banks, ditches and drains in the area also attest to the process of land reclamation which made the area habitable (e.g. NHER13785 and 27891).

The 1884 and 1904 OS maps show the development area as farmland crossed by a meandering northwest-southeast aligned drain connecting to the Bawsey Drain. This remains visible, as does a structure in the far south-east corner of the site until 1974.

2.1. Aims of the evaluation

The evaluation will seek to establish the character, date, state of preservation, and extent of any archaeological remains within the development area. The scheme of works is designed to do the following:

- Provide sufficient coverage and exposure to enable excavation to establish the approximate form, date and purpose of any archaeological deposits, together with extent, localised depth and quality of preservation.
- Provide sufficient coverage and exposure to evaluate the likely impact of past land uses, and the possible presence of masking deposits.
- Provide sufficient coverage and exposure to provide information to construct an appropriate archaeological conservation/mitigation strategy, dealing with preservation, the recording of archaeological deposits, working practices, timetables and order of cost.
- Set results in the local, regional, and national archaeological context.

2.2. Research frameworks

This investigation takes place place within, and will contribute to the goals of Regional Research Frameworks relevant to this area:

- *Research and Archaeology: A Framework for the Eastern counties: 1. Resource Assessment* (Glazebrook 1997, East Anglian Archaeology Occasional Papers 3);
- *Research and Archaeology: A Framework for the Eastern counties: 2. Research Agenda and Strategy* (Brown & Glazebrook 2000, East Anglian Archaeology Occasional Papers 8)
- *Research and Archaeology Revisited: A Revised Framework for the East of England* (Medlycott 2011, East Anglian Archaeology Occasional Papers 24).

3. Methods

The archaeological evaluation will be conducted in accordance with current best archaeological practice and the appropriate national and regional standards and guidelines.

All work will be conducted in accordance with the Institute for Archaeologists':

- Code of Conduct
- Standard and Guidance for Archaeological Watching Briefs
- Standard and Guidance for Archaeological Field Evaluations
- Standard and Guidance for Archaeological Excavation.

Additional guidelines, specific to the region, which we also adhere to are:

- *Standards for Field Archaeology in the East of England* (East Anglian Archaeology Occasional Paper 14)

Fieldwork will also be undertaken in accordance with the requirements of the OA Field Manual (ed. D Wilkinson 1992), and the revised OA fieldwork manual (publication forthcoming). Further guidance is provided to all excavators in the form of the OA *Fieldwork Crib Sheets – a companion guide to the Fieldwork Manual.* These have been issued ahead of formal publication of the revised Fieldwork Manual.

3.1. Background research

Data from the Norfolk Historic Environment Record (HER) has been obtained for this project (a 500m search radius, commissioned 15/06/2015) and read in preparation of this document. The relevant results are briefly summarised in Section 2above. The results will be fully incorporated into the final evaluation report and supplemented by further documentary research where appropriate.

3.2. Trial Trenching

A total of 600m of linear trenching (seven 40m long by 2m wide trenches and one 20m long by 2m wide trenche) will be excavated across the area proposed for development. This will achieve a 5% sample of the area suitable for evaluation (1.2ha – which exclued an easement around the Baswety Drain, a mains sewer and areas where trees are present).

A plan of the proposed 5% trench layout is attached to this WSI.

The trenches will be excavated by a mechanical excavator to the depth of the first geological horizon, or to the upper interface of archaeological features or deposits, whichever is encountered first. On the basis of the borehole data it is anticipated that archaeological features and deposits that are a) potentially surviving; b) potentially under threat from development and c) cable of being investigated by trial trenched evaluation, will be stratified immediately below the topsoil and any made ground deposits.

A toothless ditching bucket (2m wide) will be used to excavate all trenches.

Topsoil, subsoil, and archaeological deposits will be kept separate during excavation, to allow for sequential backfilling of excavations. Trenches will not be backfilled without the approval of the Planning Archaeologist from Norfolk County Council Historic Environment Service.

All machine excavation will take place under constant supervision of a suitably qualified and experienced archaeologist. The top of the first archaeological deposit will be cleared by machine, but will then be cleaned off by hand. Exposed surfaces will be cleaned by trowel and hoe as necessary, in order to clarify located features and deposits. Any archaeological deposits present will then be excavated by context to the level of the geological horizon where safe to do so. Trench spoil will be scanned visually and with a metal detector to aid recovery of artefacts.

3.3. Excavation of archaeological features and deposits

Excavation of all archaeological deposits will be done by hand unless it can be shown there will be no loss of evidence using a machine. The method of excavation will be decided by the senior project archaeologist. Significant archaeological features (e.g. solid or bonded structural remains, building slots or post-holes) will be preserved intact, even if fills are sampled.

Exposed surfaces will be cleaned by trowel and hoe as necessary in order to clarify features and deposits. Unless otherwise agreed by the Planning Archaeologist at Norfolk County Council Historic Environment Service, all features will be investigated and recorded to provide an accurate evaluation of archaeological potential, whilst at the same time minimising disturbance to archaeological structures, features and deposits.

There will be sufficient excavation to give clear evidence for the period, depth, and nature of any archaeological deposit. Investigation slots through all linear features will be a least 1m in width. Discrete features will be half-sectioned or excavated in quadrants where they are large or found to be deep. In necessary, boreholes will be used to gain information from deep deposits below 1m in depth.

The depth, nature and potential artefact content of colluvial or other masking deposits will also investigated and recorded across the site. Buried soils will be tested pitted, or bucket sampled at 20m intervals (90 litres sampled per 20m)

Any natural subsoil surface revealed will be hand cleaned and examined for archaeological deposits and artefacts.

3.4. Recording of archaeological features and deposits

Records will comprise survey, drawn, written and photographic data.

Each feature will be individually documented on context sheets, and hand drawn in section and plan. Written descriptions will be recorded on pro-forma sheets comprising factual data and interpretative elements.

Where stratified deposits are encountered, a Harris Matrix will be compiled during the course of the excavation.

Site plans will normally be drawn at 1:100, but on deeply-stratified sites a scale of 1:50 or 1:20 will be used. Detailed plans of individual features or groups will be at an appropriate scale (1:10 or 1:20). The site grid will be accurately tied into the Ordnance Survey National Grid and located on the 1:2500 or 1:1250 map of the area.

Long sections showing layers will be drawn at 1:50. Sections of features or short lengths of trenches will be drawn at 1:20. A register of sections will be kept. All sections will be tied in to Ordnance Datum.

The photographic record will comprise high resolution digital photographs and 35mm film black and white photographs.

3.5. Environmental sampling

Paleoenvironmental remains will be sampled and processed in accordance with the guidelines set out in:

- English Heritage (2011, 2nd edition) *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation*.
- Association for Environmental Archaeology (1995) *Environmental archaeology and archaeological evaluations. Recommendations concerning the environmental archaeology component of archaeological evaluations in England*. Working Papers of the Association for Environmental Archaeology 2. York: Association for Environmental Archaeology.
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- Murphy, P.L. & Wiltshire, P.E.J. (1994) *A guide to sampling archaeological deposits for environmental analysis*
- English Heritage (2011) *Environmental Archaeology, A guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-Excavation*.

Bulk samples (40 litres or 100% of context) will be taken from a range of site

features and deposits to target the recovery of plant remains (charcoal and macrobotantiocals) fish, bird, small mammal and amphibian bone and small artefacts. Typically, 10 litres of each bulk sample will be processed using tank flotation, with the remaining sub-sample processed where appropriate or necessary. Waterlogged samples will be wet sieved and stored in cool or wet conditions as appropriate.

Where practical, waterlogged wood specimens will be recorded in detail on site, *in situ*. When removed, they will be cleaned and photographed, and stored in wet cool conditions for assessment by a suitably qualified specialist (see Appendix 1)

Where encountered and deemed necessary at this stage, monolith tins will be taken through palaeosols to target the recovery of pollen, molluscs, foraminifera, parasites and insects. The soil will also be inspected on site, or samples taken and assessed off site, for its suitability for micromorphological study or other analytical techniques. This will be conducted by a suitably qualified specialist (see Appendix 1). Bulk samples will also be taken through palaeosols.

Where deemed necessary at this stage, range finder scientific dates will be obtained for critical contacts, e.g. the basal contact of peats over former dryland surfaces.

The project team will consult Historic England's Scientific Advisor on environmental sampling and dating where necessary.

3.6. Investigation of human remains

If human remains are encountered, the client and the Planning Archaeologist at Norfolk County Council Historic Environment Service will be immediately informed.

Excavation may be required where the remains are under imminent threat, or if information on date and preservation is required.

No further excavation will then place in the vicinity of the remains until removal becomes necessary. Human remains will be excavated in accordance with all appropriate Environmental Health regulations, and will only occur after we obtain a Home Office licence.

Due to the wide range of variables involved with the excavation of human remains, costs for excavation, removal, and analysis of human remains has not been included in any statement of costs accompanying or associated with this specification.

3.7. Metal detecting and the Treasure Act

All features and spoil deriving from excavation with metal detected by an experienced detector user.

If finds are made that might constitute ‘Treasure’ under the definition of the Treasure Act (1996), they will if possible be excavated and removed to a safe place. We will report such finds to the local Coroner within 14 days, in accordance with the Act. Should it not be possible to remove the finds that day, suitable security will be arranged.

3.8. Finds processing

A finds supervisor will be appointed to oversee the collection, processing, cataloguing, and specialist advice on all artefacts collected. Artefacts will be

collected by hand and metal detector, assigned a context number and returned to OAE offices daily for processing.

All artefacts will be treated in accordance with UKIC guidelines, *First Aid for Finds* (1998). All finds will be bagged and labelled according to the individual deposit from which they were recovered, ready for later cleaning and analysis.

Processing will take place in tandem with excavation, and advice will be sought from relevant specialists on key artefact types (See Appendix 1 for a list of specialists). The Project Manager and fieldwork project officer will be given feedback to enable them to develop excavation strategies during fieldwork.

Any finds requiring specialist treatment and conservation will be sent for appropriate treatment.

3.9. Archiving

The site archive will conform to the requirements of MoRPHE and the deposition of archaeological archives with Norfolk County Council.

OA East will seek to transfer title of ownership of the complete project archive to a registered local depository at the appropriate time. Until then, all artefactual and paper archive material relating to the project will be held in storage by OA East

All archives will comply in format with PPN3 recommendations. The project archive will follow the guidelines contained in Guidelines for the Preparation of Excavation Archives for Long Term Storage (United Kingdom Institute for Conservation, 1990), Standards in the Museum care of Archaeological Collections (Museums and Galleries Commission 1992) and Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation (Brown 2007). Costs associated with the deposition of the archive will be met by the client.

4. Reporting

4.1. Evaluation report

The evaluation report will provide an objective account of the archaeological investigation and its findings. It will contain a comprehensive, illustrated assessment of the local and regional context in which the archaeological evidence rests, and highlight any relevant research issues within regional and nation research frameworks.

The report will include:

- a title page detailing site address, site code and accession number, NGR, author/originating body, client's name and address
- full list of contents
- a non-technical summary of the findings
- a description of the geology and topography of the area
- a description of the methodologies used
- a description of the findings
- site and trench location plans, and plans of each area excavated showing the archaeological features found
- sections of excavated features
- interpretation of the archaeological features found

- specialist reports on artefacts and environmental finds
- relevant photographs of features
- a predictive model of surviving archaeological remains, where affected by development proposals, and assessment their importance
- the OASIS reference and summary form.

4.2. Draft and final reports

A draft digital copy of the report will be supplied to the Norfolk Historic Environment Service Planning Archaeologists for comment. Following approval of the draft report, a copy will be sent to the client for submission to the Local Planning Authority, and a copy will supplied to the Norfolk Historic Environment Service for deposition with the HER.

A copy of the approved report will be uploaded to the OASIS database.

5. Timetable

Trial trenching is expected to take 4-5 working days to complete. This does not allow for delays caused by bad weather.

Post-excavation processing and assessment tasks will commence shortly after excavation commences, to inform the excavation strategy, and minimise time required to prepare the final report after excavation is completed.

Post-excavation tasks and report writing will take a maximum of 4 weeks following the end of fieldwork, unless there are exceptional discoveries requiring more lengthy analysis.

6. Staffing and support

6.1. Fieldwork

The fieldwork team will be made up of the following staff:
1 x Project Manager (supervisory only, not based on site)
1 x Project Officer/Supervisor (full-time)
2 x Site Assistants (as required)
1 x Finds Assistant (part-time, as required)
1 x Environmental Assistant (part-time, as required)

The Project Manager will be Matthew Brudenell.

All Site Assistants will be drawn from a pool of qualified and experienced staff. Oxford Archaeology East will not employ volunteer, amateur, or student staff, whether paid or unpaid, except as an addition to the team stated above.

6.2. Post-excavation processing

Pottery will be assessed by Sarah Percival (Prehistoric), Alice Lyons (Roman) and Dr Paul Spoerry (Saxon and Medieval).

Environmental analysis will be carried out by OA East staff, in consultation with the OA Environmental Department in Oxford. The results will be reported to the Historic

England Scientific Advisor. Environmental analysis will be undertaken by Rachel Fosberry (charred plant macrofossils, plant macrofossils), Liz Stafford (land molluscs), and Denise Druce and Mairead Rutherford (pollen analysis).

Faunal remains will be examined by Chris Faine.

Conservation will be undertaken by Colchester Museums.

In the event that OA's in-house specialists are unable to undertake the work within the time constraints of the project, or if other remains are found, specialists from the list at Appendix 1 will be approached to carry out analysis.

7. Other matters

7.1. Insurance

OA East is covered by Public and Employer's Liability Insurance. The underwriting company is Allianz Cornhill Insurance plc, policy number SZ/14939479/06. Details of the policy can be seen at the OA East office.

7.2. Services, Public Rights of Way, Tree Preservation Orders etc.

The client will inform the project manager of any live or disused cables, gas pipes, water pipes or other services that may be affected by the proposed excavations before the commencement of fieldwork. Hidden cables/services should be clearly identified and marked where necessary.

The client will likewise inform the project manager of any public rights of way or permissive paths on or near the land which might affect or be affected by the work.

The client will also inform the project manager of any trees subject to Tree Preservation Orders within the subject site or on its boundaries

7.3. Site security

Unless previously agreed with the Project Manager in writing, this specification and any associated statement of costs is based on the assumption that the site will be sufficiently secure for archaeological work to commence. All security requirements, including fencing, padlocks for gates etc. are the responsibility of the client.

7.4. Access

The client will secure access to the site for archaeological personnel and plant, and obtain the necessary permissions from owners and tenants to place a mobile office and portable toilet on or near to the site. Any costs incurred to secure access, or incurred as a result of withholding of access will not be OA East's responsibility. The costs of any delays as a result of withheld access will be passed on to the client in addition to the project costs already specified.

7.5. Site preparation

The client is responsible for clearing the site and preparing it so as to allow archaeological work to take place without further preparatory works, and any cost statement accompanying or associated with this specification is offered on this basis. Unless previously agreed in writing, the costs of any preparatory work required, including tree felling and removal, scrub or undergrowth clearance,

removal of concrete or hard standing, demolition of buildings or sheds, or removal of excessive overburden, refuse or dumped material, will be charged to the client, in addition to any costs for archaeological evaluation already agreed.

7.6. Backfilling/Reinstatement

Backfilling but not reinstatement of trenches is included in the cost unless otherwise agreed with the client.

7.7. Monitoring

The relevant planning authority will be informed appropriately of dates and arrangements to allow for adequate monitoring of the works. Monitoring will be conducted by representatives from the Norfolk Historic Environment Service, and meetings may be attended by the OA East project manager and the client to discuss findings and progress.

7.8. Health and Safety, Risk Assessments

A risk assessment covering all activities to be carried out during the lifetime of the project will be prepared before work commences. This will draw on OA East's activity-specific risk assessment literature and conforms with CDM requirements.

All aspects of the project, both in the field and in the office will be conducted according to OA East's Health and Safety Policy, Oxford Archaeology Ltd's Health and Safety Policy, and Health and Safety in Field Archaeology (J.L. Allen and A. St John-Holt, 1997). A copy of OA East's Health and Safety Policy can be supplied on request.

APPENDIX 1: CONSULTANT SPECIALISTS

NAME	SPECIALISM	ORGANISATION
Allen, Leigh	Worked bone, CBM, medieval metalwork	Oxford Archaeology
Allen, Martin	Medieval coins	Fitzwilliam Museum
Anderson, Sue	HSR, pottery and CBM	Suffolk County Council
Bayliss, Alex	C14	English Heritage
Biddulph, Edward	Roman pottery	Oxford Archaeology
Bishop, Barry	Lithics	Freelance
Blinkhorn, Paul	Iron Age, Anglo-Saxon and medieval pottery	Freelance
Boardman, Sheila	Plant macrofossils, charcoal	Oxford Archaeology
Bonsall, Sandra	Plant macrofossils; pollen preparations	Oxford Archaeology
Booth, Paul	Roman pottery and coins	Oxford Archaeology
Boreham, Steve	Pollen and soils/ geology	Cambridge University
Brown, Lisa	Prehistoric pottery	Oxford Archaeology
Cane, Jon	illustration & reconstruction artist	Freelance
Champness, Carl	Snails, geoarchaeology	Oxford Archaeology
Cotter, John	Medieval/post-Medieval finds, pottery, CBM	Oxford Archaeology
Crummy, Nina	Small Find Assemblages	Freelance
Cowgill, Jane	Slag/metalworking residues	Freelance
Darrah, Richard	Wood technology	Freelance
Dickson, Anthony	Worked Flint	Oxford Archaeology
Donelly, Mike	Flint	Oxford Archaeology
Doonan, Roger	Slags, metallurgy	
Druce, Denise	Pollen, charred plants, charcoal/wood identification, sediment coring and interpretation	Oxford Archaeology
Drury, Paul	CBM (specialised)	Freelance
Evans, Jerry	Roman pottery	Freelance
Faine, Chris	Animal bone	Oxford Archaeology
Fletcher, Carole	Medieval pot, glass, small finds	Oxford Archaeology
Fosberry, Rachel	Charred plant remains	Oxford Archaeology
Fryer, Val	Molluscs/environmental	Freelance
Gale, Rowena	Charcoal ID	Freelance
Geake, Helen	Small finds	Freelance
Gleed-Owen, Chris	Herpetologist	
Goffin, Richenda	Post-Roman pottery, building materials, painted wall plaster	Suffolk CC
Hamilton-Dyer, Sheila	Fish and small animal bones	
Howard-Davis, Chris	Small finds, Mesolithic flint, RB coarse pottery, leather, wooden objects and wood technology;	Oxford Archaeology
Hunter, Kath	Archaeobotany (charred, waterlogged and mineralised plant remains)	Oxford Archaeology
Jones, Jenny	Conservation	ASUD, Durham

NAME	SPECIALISM	ORGANISATION
		University
King, David	Window glass & lead	
Locker, Alison	Fishbone	
Loe, Louise	Osteologist	Oxford Archaeology
Lyons, Alice	Late Iron Age/Roman pottery	Oxford Archaeology
Macaulay, Stephen	Roman pottery	Oxford Archaeology
Masters, Pete	geophysics	Cranfield University
Middleton, Paul	Phosphates/garden history	Peterborough Regional College
Mould, Quita	Ironwork, leather	
Nicholson, Rebecca	Fish and small mammal and bird bones, shell	Oxford Archaeology
Palmer, Rog	Aerial photographs	Air Photo Services
Percival, Sarah	Prehistoric pottery, quern stones	Freelance
Poole, Cynthia	Multi-period finds, CBM, fired clay	Oxford Archaeology
Popescu, Adrian	Roman coins	Fitzwilliam Museum
Rackham, James	Faunal and plant remains, can arrange pollen analysis	
Riddler, Ian	Anglo-Saxon bone objects & related artefact types	Freelance
Robinson, Mark	Insects	
Rowland, Steve	Faunal and human bone	Oxford Archaeology
Rutherford, Mairead	Pollen, non-pollen palynomorphs, dinoflagellate cysts, diatoms	Oxford Archaeology
Samuels, Mark	Architectural stonework	Freelance
Scaife, Rob	Pollen	
Scott, Ian	Roman, Medieval, post-medieval finds, metalwork, glass	Oxford Archaeology
Sealey, Paul	Iron Age pottery	Freelance
Shafrey, Ruth	Worked stone, cbm	Oxford Archaeology
Smith, Ian	Animal Bone	Oxford Archaeology
Spoerry, Paul	Medieval pottery	Oxford Archaeology
Stafford, Liz	Snails	Oxford Archaeology
Strid, Lena	Animal bone	Oxford Archaeology
Tyers, Ian	Dendrochronology	
Ui Choileain, Zoe	Human bone	Oxford Archaeology
Vickers, Kim	Insects	Sheffield University
Wadeson, Stephen	Samian, Roman glass	Oxford Archaeology
Walker, Helen	Medieval Pottery in the Essex area	
Way, Twigs	Medieval landscape and garden history	Freelance
Webb, Helen	Osteologist	Oxford Archaeology
Willis, Steve	Iron Age pottery	
Young, Jane	Medieval Pottery in the Lincolnshire area	
Zant, John	Coins	Oxford Archaeology

Radiocarbon dating is normally undertaken for Oxford Archaeology East by SUERC and by the Oxford University Accelerator Laboratory.
Geophysical prospection is normally undertaken by Cranfield University, Geoquest, and Geophysical Surveys, Bradford.

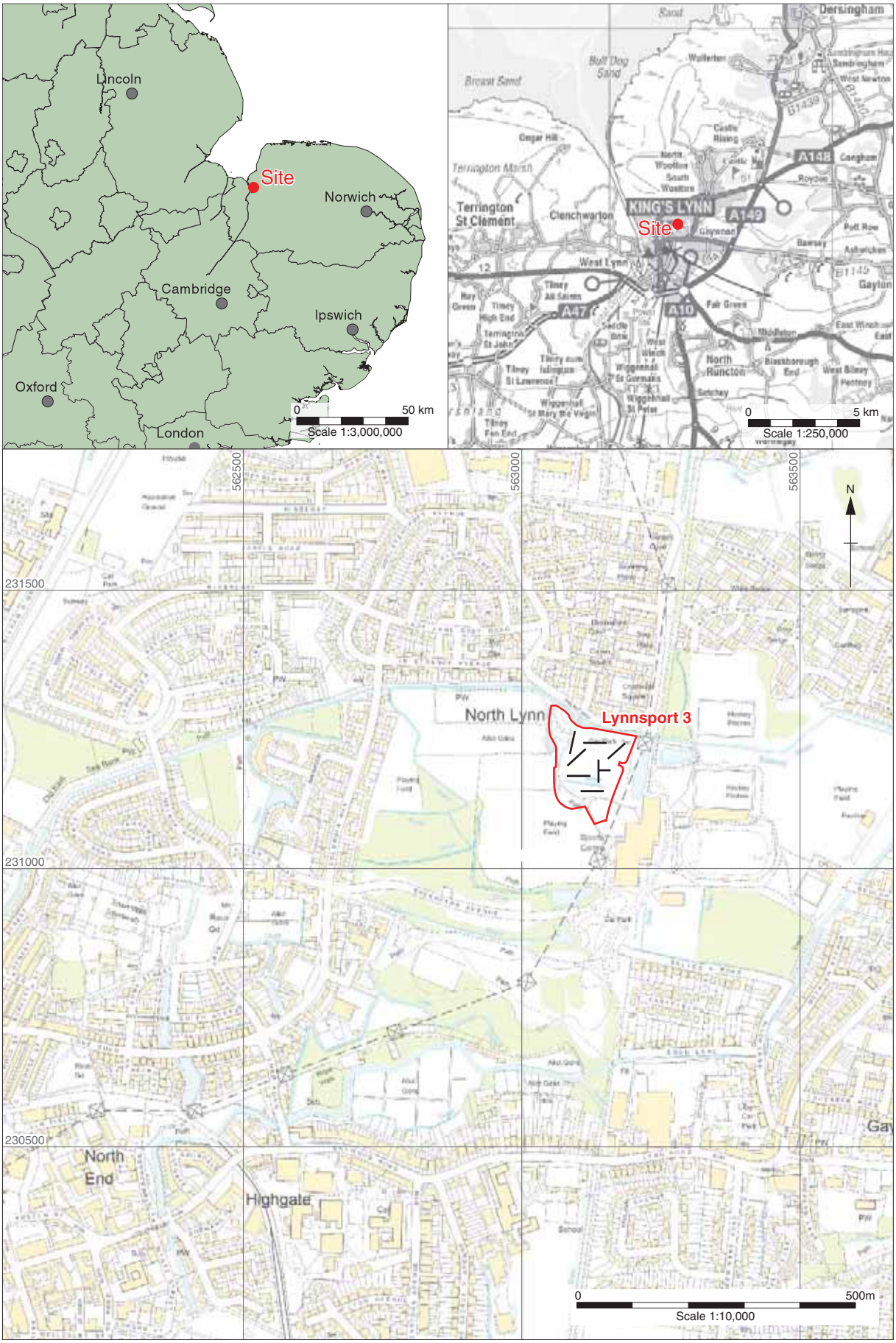

Figure 1: Site location showing archaeological trenches (black) in development area (red)

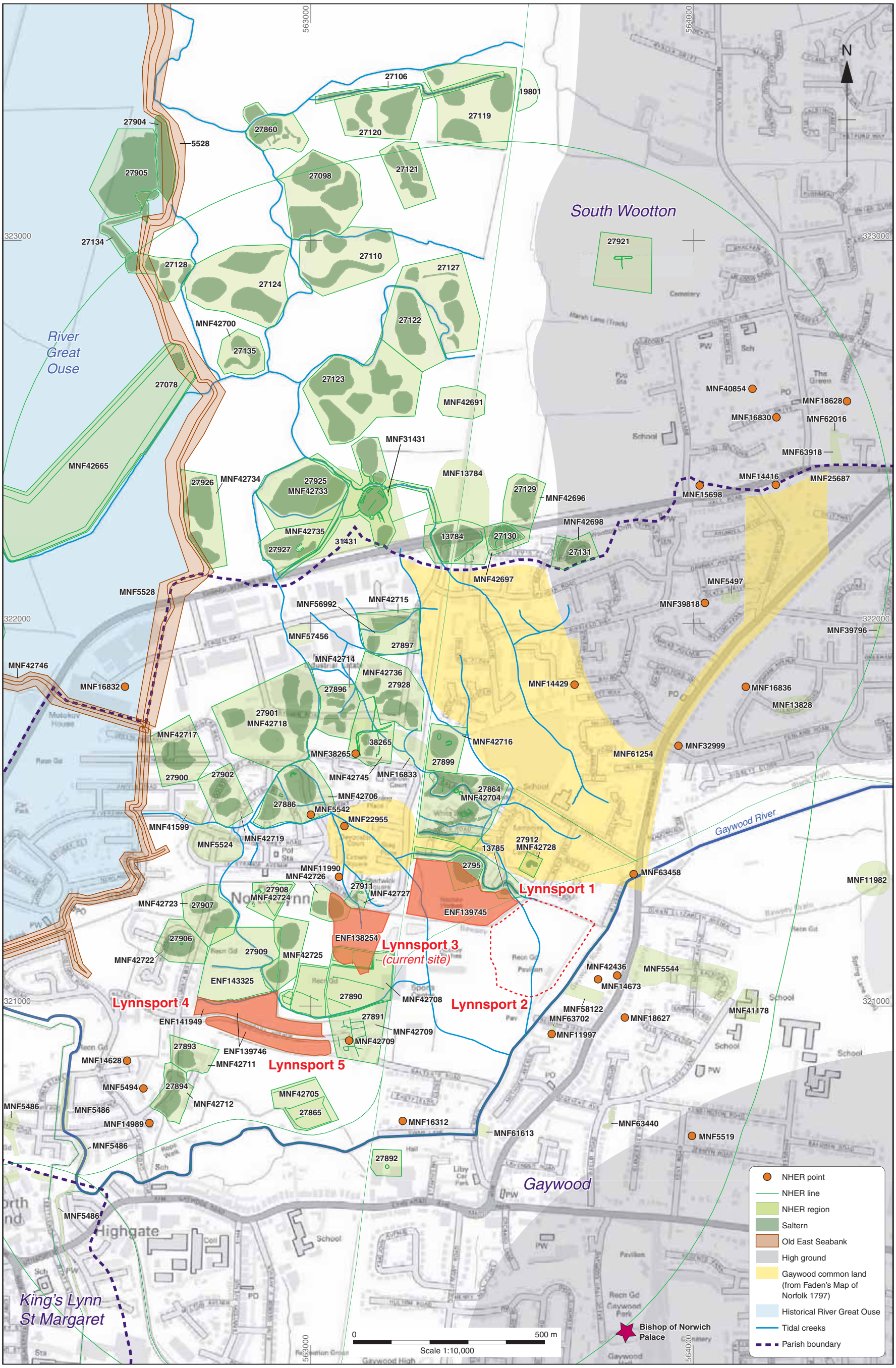

Figure 2: Map showing location of NHER records with NMP data (Copyright Historic England National Mapping Programme, licensed to Norfolk County Council). Sea banks & pre-existing tidal creeks mapped from historic photograph (NHER reference: TF62_TF6321_A_RAF_16Apr1946.tif). Site development areas shown in red.

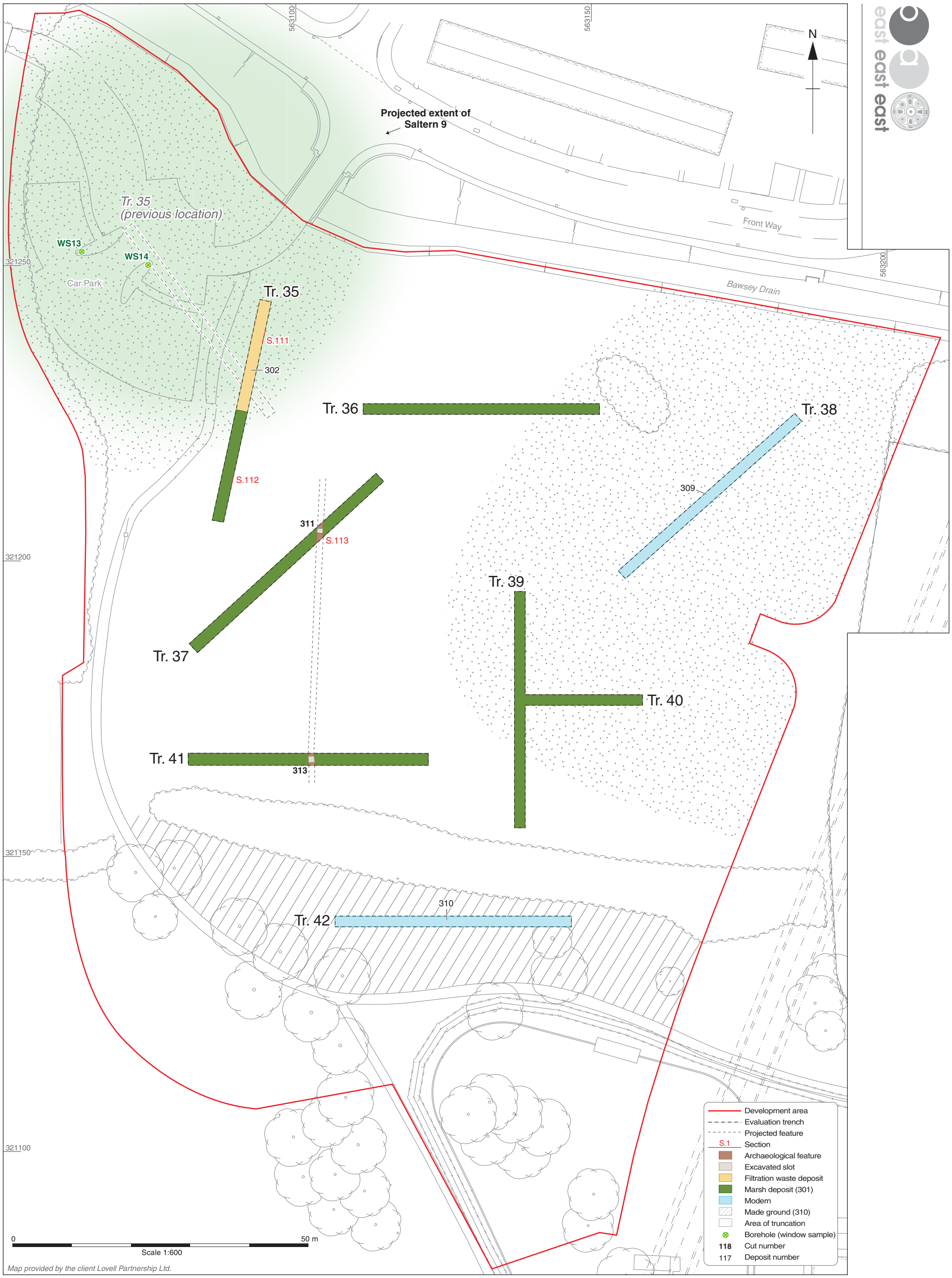

Figure 3: Results of evaluation

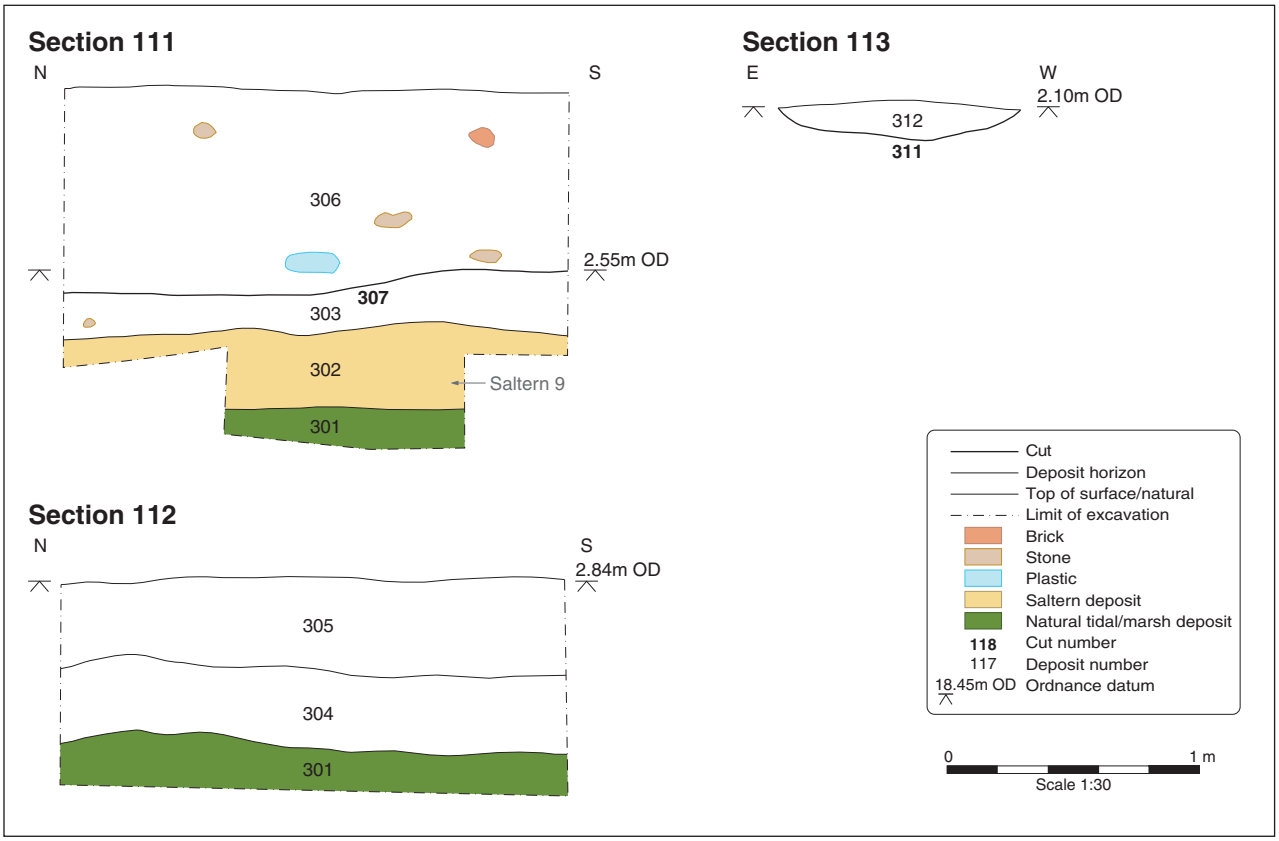

Figure 4: Selected sections

Plate 1: Historic aerial photograph with the site outlined in red (NHER reference: TF62_TF6321_A_RAF_16Apr1946.tif)

Plate 2: The site, looking southeast towards Trenches 38-40

Plate 3: The site, looking west towards car park

Plate 4: Drilling borehole WS13, looking south

Plate 5: Trench 35, looking north

Plate 6: Section 111 of Saltern 9 in Trench 35, looking east

Plate 7: Trench 38, looking north

Plate 8: Trench 41, looking west

Plate 9: Trench 42, looking east

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