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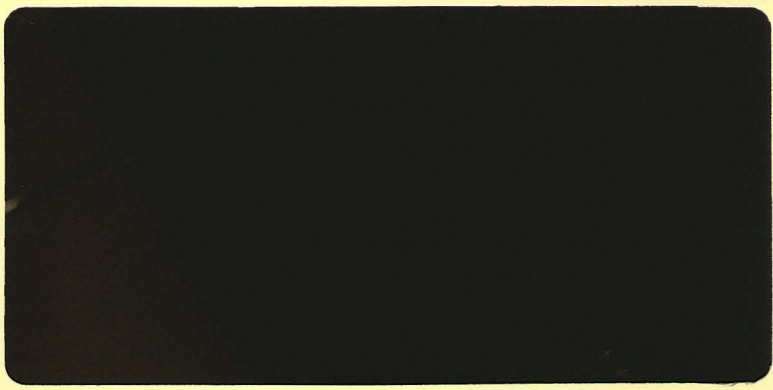
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**ARCHAEOLOGICAL  
ASSESSMENT REPORT  
ON LAND AT  
WYGATE PARK  
SPALDING  
LINCOLNSHIRE  
(SWP05)**

**Volume 1**



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SERVICES



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**Volume 1**

Report Prepared for CgMs midlands  
On behalf of Allison Homes

April 2006

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PROJECT SERVICES

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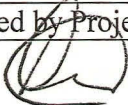
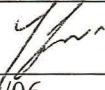
11 MAY 2006

Highways & Planning  
Directorate

**Archaeological Assessment Report On Land At Wygate Park,  
Spalding, Lincs  
(SWP05)**

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## 1. INTRODUCTION

Archaeological Project Services was commissioned by CgMs on behalf of Allison Homes to undertake a scheme of archaeological works ahead of residential development on land at Wygate Park, Spalding, Lincolnshire. A Written Scheme of Investigation was prepared for the site (Dawson 2003) following consultations between M. Dawson of CgMs and J. Bonnor of Lincolnshire County Council.

### 1.1 Previous Work at the Site

The area is part of the site of a proposed residential development. Following a call-in enquiry (H16/0578/01), the Secretary of State has granted planning permission.

The site has been subject to past archaeological investigations in the form of a desk-based assessment (Albone 2000) and a geophysical survey (Oxford Archaeotechnics 2002). Following this, a programme of trial trenching was implemented, revealing a well-preserved saltern and other features of Late Iron Age through to medieval date (Snee 2003). A subsequent geophysical survey was conducted at the site (Gaffney 2004) prior to the SWP05 investigation.

An excavation on Wygate Park Phase 9 (SWPB04), immediately to the north, revealed an early Roman saltern hearth and associated features, including settling pits and palaeochannels (Fig. 3).

A recently completed excavation on Area C (SWPC05) at the eastern end of the development site revealed a system of medieval dyings indicating agricultural land use from the 12<sup>th</sup> Century AD (Murphy 2006).

### 1.2 Mitigation Excavation

Based on the results of the evaluation and subsequent geophysical survey the South

Holland planning archaeologist requested that further archaeological works were undertaken. This comprised a full excavation of the evaluated area of the development site (Area A). The excavation area encompassed approximately six hectares revealing archaeological deposits from the late Iron Age to 4<sup>th</sup> Century AD Roman sealed under post-Roman silting.

### 1.3 Aims and Objectives

In advance of all site work a full specification was written by APS and approved by J. Bonnor of Lincolnshire County Council. The aims and objectives outlined below summarise those of the specification.

- The aim of the investigation was to make a full record of the features and deposits present in order to enable accurate interpretation, analysis and publication.
- The broad objectives of the investigation were:
  - Establish the character and nature of archaeological activity present within the site.
  - Determine the extent of archaeological activity present on the site.
  - Define the date and function of the archaeological features present on the site.
  - Establish the relationship of the saltern-related deposits to other features.
  - During post excavation relate the Wygate Park excavation to comparable sites at a regional level.
- Specific objectives in respect of saltmaking site were to: -

- Define the character of the saltmaking and related processes by studying the presence/ absence/ form/ character/ distribution of the structural components and artefactual waste
- Define the chronological range of the site using artefactual and scientific dating means
- Define the structure and nature of the saltern by identifying its component parts. These are thought to include hearths/ ovens, settling tanks, channels, working floors, wooden shelters, track ways, bonfire hearths, filtration units, feeder channels and dykes.
- Relate the saltern deposits to any contemporary settlement or other use of the area.
- Determine the environmental conditions and landscape changes at, and adjacent to, the site and the potential for ancient use of the landscape
- Determine the economy of the site with special reference to craft specialization, saltmaking and agriculture
- Determine whether saltmaking was a seasonal activity and whether the site was occupied all or part of the year
- Examine any evidence of the methods of trading salt
- To preserve the archaeological resource within the development area by means of excavation and full recording, interpretation and reporting of archaeological features
- To identify and investigate all archaeological remains present on the site
- To retrieve structural/stratigraphic, artefactual and environmental data
- To determine the date and function of individual features and of the site as a whole
- To determine the local contemporary environment, identify changes therein through time and interpret reason for changes
- To determine economic base of the site and changes therein through time

## **2 INTEGRATED ASSESSMENT REPORT**

### **2.1 Site Location, Topography and Geological Background**

Spalding is situated 23km southwest of Boston and 71km southeast of Lincoln in the administrative district of South Holland. The site is located to the northwest of the town between existing residential areas to the south and east (Figs 1 & 2).

The area of excavation lies at the west end of the development site and covers an area of approximately 6.2ha, with 4 ha having been stripped for excavation (Fig. 2). The area of excavation is centred on National Grid Reference TF 2350 2305

The site is on gently undulating ground rising slightly to the west, at approximately 3m OD. Local soils are the coarse silty calcareous alluvial gleys of the Wisbech Association developed on marine alluvium (Robson 1990). These silts



overlie a solid geology of Oxford Clay and Kellaways Beds, which occur here at considerable depth.

## 2.2 Historical and Archaeological Background

From the Neolithic through to mid - to late Iron Age, the area around Spalding was subject to periods of marine incursion and, consequently, there was little human use of the landscape during that time. By the later part of the Iron Age, the landscape had dried to the extent that it could be used for limited occupation and industrial purposes (Hayes & Lane 1992).

Saltmaking was the predominant industrial use and many Iron Age salt production sites are now known in the Fenland, particularly in the Cowbit area, south of Spalding (Hayes and Lane 1992). Nearer to Wygate Park, an Iron Age site comprising multiple pits was located in Pinchbeck Fen (Crowson *et al* 2000) and late Iron Age pottery associated with a saltern found during evaluation at Horseshoe Road, Spalding, 750m south of Wygate Park (Herbert 1997). Iron Age pottery and deposits were found in association with saltmaking during the evaluation undertaken at Wygate Park (Snee 2003).

Saltmaking appears to have expanded significantly during the early Roman period, with many sites being identified in the area around Spalding (Hayes and Lane 1992). Recent excavation on Wygate Park Phase 9, immediately to the north of the application area, revealed a saltern hearth and associated features, including settling pits and palaeochannels. From the hearth, an archaeomagnetic date of AD 130-240 indicated use in the early Roman period (Hall forthcoming) and, by inference, a continuation of marine dominated environments into that period. Briquetage forms from the Phase 9 excavation indicate that an indirect heating system

was in use and there is a distinct lack of pedestals and clips within the assemblage, mirroring the range and content of the briquetage assemblage recovered during trial trenching of the present site of SWP05 (Morris 2003).

Later in the Roman period, a drop in sea level resulted in extensive settlement on the marine silts. Crop marks of Romano-British field systems and droveways have been recorded to the west (e.g. Hallam 1970, Fig 8). In addition recent investigations in the centre of Spalding have also exposed Romano-British deposits sealed by later silts (Cope-Faulkner, forthcoming).

Subsequent marine incursions late in the period, probably during the 4th century, resulted in the abandonment of these sites and the masking of Romano-British ground levels and deposits by alluvial silts.

By the Middle Saxon period the land to the west of Wygate Park was occupied, possibly initially by salt makers, but eventually by farmers. A number of sites of this date have been excavated in Gosberton and Pinchbeck (Crowson *et.al.* 2005)

Historically the proposed development site lay within Pinchbeck parish. Pinchbeck is first referred to as *Pincebec* in the Domesday Survey of 1086. The place-name refers to the stream associated with either the minnow or the linnet (Cameron 1998, 97).

At the time of the Domesday Survey, Ivo Tallboys and Guy of Craon held land at Pinchbeck. Included among Tallboy's holdings were 4 fisheries producing 1500 eels.

The 17th century was the great period of fen drainage. Vernatt's Drain, to the northwest of the site, was constructed in the 1630s as part of the drainage of Deeping Fen (Wheeler 1896, 318). A

manuring scatter of pottery represents the only post-medieval period (1650 - 1850 AD) deposits located (Albone 2000, 8).

### 2.3 Stratigraphic Assessment

#### Area Division

Wygate Park was divided at the fieldwork stage into four distinct areas, defined by geographical location and perceived land use.

#### Iron Age Area:

Droeway and stock control features cut into a pre Iron Age roddon within the eastern area of site (Fig. 9). Identified in evaluation Trench 15 as Late Iron Age deposits (Snee 2003).

#### Saltern:

An early Roman saltmaking area formed on a raised briquetage mound. The saltern included multiple phases of settling tanks, hearths and posthole structures (Fig 10).

#### Southern Settlement:

Enclosure systems, post hole structures, a waterhole (well) and a rectangular ditched structure, provisionally dated to the Romano-British period and located in the southern area of the development site (Fig 11).

#### Northern Settlement:

Small enclosure systems cut to drain into an existing creek system. Located in the northern area of the development site close to the Phase 9 excavations. (Fig 12).

Following initial post excavation analysis of stratigraphy and pottery spot dating, Wygate Park was phased by chronology and land use.

#### Phase Division

Seven main phases were identified at the site from the analysis of context records, drawn records and stratigraphic matrices, in conjunction with the spot dating of the pottery. Each phase represents a distinct land use and some chronological crossover between phases exists.

- |                 |   |
|-----------------|---|
| <b>Phase 1:</b> | Pre Late Iron Age deposits                            |
| <b>Phase 2:</b> | Late Iron Age - Early 2 <sup>nd</sup> C AD droeway    |
| <b>Phase 3:</b> | 1 <sup>st</sup> - Early 2 <sup>nd</sup> C AD Saltern  |
| <b>Phase 4:</b> | 2 <sup>nd</sup> - 3 <sup>rd</sup> C AD settlement     |
| <b>Phase 5:</b> | Mid 3 <sup>rd</sup> - 4 <sup>th</sup> C AD enclosures |
| <b>Phase 6:</b> | Post Roman flooding                                   |
| <b>Phase 7:</b> | Medieval, Post medieval and modern                    |

Features and deposits excavated are quantified as Appendix 2.

#### The Archive

The following summarises the site archive available for assessment.

- 3441 Individual context records
- 530 Section drawings at scale 1:10
- 838 Plan drawings at scale 1:20
- Computerised overall post-excavation site plan
- 5 Stratigraphic site area matrices

Archaeological cut features with multiple interventions have been given group cut and deposit numbers where possible.

Stratigraphic grouping is a tool for logically joining either cuts or deposits. Archaeological features with multiple excavated interventions (slots) can be 'grouped', under a single number allowing the feature to be discussed as a whole. Deposits traceable between interventions can be grouped in the same manner. Isolated deposits not found in adjoining

slots are not grouped but remain in the stratigraphic sequence.

This technique creates a greater understanding of how the feature was created and also the depositional sequence within it. In addition by applying a rigorous critique to complete features, errors in individual sections can be recognized and corrected. All group numbers are within contexts (3000-3999).

### **Phase 1**      *Pre Late Iron Age deposits*

This phase encompasses natural deposits largely laid down by tidal creeks during the pre late Iron Age marine incursions. Archaeological features were cut into either silted up roddons or pre-Roman silts. Phase 1 deposits were most likely formed during the Bronze Age and earlier Iron Age when the Wygate area was dominated by saltmarsh and dendritic marine creek systems. A notable feature in this phase is a large lagoon or salt panne [2121] that formed immediately east of the southern settlement area.

Salt pans were created by natural depressions in the saltmarsh, which fill with salt water during tidal inundations forming saline pools. Salt pans are common in all saltmarshes and are notable fish and waterfowl habitats (Mass Audubon 2006, Wilson 2005). The salt pan at Wygate [2121] must have formed during a period of active salt marsh prior to the Roman period. The salt pan was clearly a feature during the Roman phase as several field system ditches drain into it during the 2<sup>nd</sup> – 3<sup>rd</sup> centuries AD.

### **Phase 2**      *Late Iron Age droveway*

Phase 2 represents the cutting of droveway style ditches and associated features across a pronounced ridge on the eastern area of the site. The ridge formed as the result of the silting up of a tidal creek, probably in

the Bronze Age. In addition a rectangular ditched enclosure located in the southern settlement may be contemporary with Phase 2 (Figs 9 & 11).

The focal point of Phase 2 was a pair of curving ditches [3140] [3131] aligned approximately north south across the roddon (Fig. 9). The ditches created a narrow entranceway approximately 10m wide to the south and broadening out to accommodate a space 50m wide to the north. These ditches have been interpreted as a droveway, guiding stock along the length of the raised roddon. Ditch [3154] aligned east west along the roddon may have been an extension to the droveway moving stock towards the northern settlement and SWPB04 Phase 9.

Several L-shaped ditches were located within the droveway area, possibly remnants of holding pens. Ditch [3135] was positioned within the centre of the droveway measuring 12m long by 1.8m wide and 0.9m deep. A similar ditch [3143] was located 30m to the north west of [3135] forming another possible set of holding pens and truncating [3157] an earlier curved ditch. The final short curved ditch [3160] was located just north of [3154] and was truncated by a ring ditch [3165].

Ring ditch [3165] measured approximately 8m in diameter with no associated postholes. This feature has been interpreted as a potential domestic dwelling possibly constructed with wattle panel walls placed within the ring ditch.

The east west aligned ditch [3168] was cut partially across the droveway truncating the north south droveway ditch [2341] identified in Trench 15 as [1514] (Snee 2003).

Finally in this phase a rectangular ditch structure [3016] [3019] located within the Southern settlement area was constructed

creating an internal space measuring approximately 11m by 7.2m (Fig.11). The rectangular structure exhibited an east and west entranceway both truncated by rectilinear pits [3013] [2406] being cut across the terminals.

### **Phase 3** *1<sup>st</sup> - early 2<sup>nd</sup> C AD Saltern* (Fig. 10)

Phase 3 represents the period of saltmaking within Wygate Park. The saltern area was predominantly defined by a mound measuring approximately 40 by 40m (120m<sup>2</sup>, Fig. 10). The mound appears to represent the deliberate raising of the ground surface with crushed briquetage and was bounded on all sides by curving enclosure ditches.

Enclosure [3221] forms a boundary around the west, south and eastern sides of the hearth area. This ditch may have originally also encompassed the northern perimeter of the hearth area but has been lost to truncation by [3225]. An east west ditch [3223] enclosed the northern area of the saltern and possibly truncates [3221]. Ditch [3221] was recut by [3222] along the same alignment. Ditch [3225] completes the northern boundary and is likely the same as [3222] or [3223]. These ditches enclose the industrial area of the saltern, working as possible drainage and seawater management features (Fig. 10 & Plate 2).

The settling tanks and hearths were contained within this enclosed area. Hearths were constructed from a large dump of clay measuring approximately 2.55 by 4m in area. Remnants of at least three hearths were noted within this clay, with the final best preserved hearth [285] being archaeomagnetically sampled. The final firing of [285] was between 80 and 140 AD with the greatest probability of 115AD (Appendix 11).

Each individual hearth formed an

elongated lozenge shaped pit with rounded terminals, measuring approximately 3.47m long by 0.75m wide. The sides of all of the hearths exhibited signs of high temperature firing, with the walls oxidized to a vitrified white colour.

The settling tanks were located directly north and south of the hearths, forming sub rectangular, straight-sided pits. At least seven phases of tank construction were present, each being typically 2m long by 1.5m wide. The tanks were normally clay lined and appear to have been recut when completely silted up.

To the east of the enclosure ditch [3221] were a series of postholes, short lengths of curving ditches and possible floor surfaces. Ditch [3227] is the least truncated of these segments and suggests an internal diameter structure of approximately 5.5m with associated postholes. The area of structure is notable for its lack of domestic debris, appearing to represent several phases of construction and abandonment without obvious habitation.

Ditch [3224] is aligned from the southern area of the saltern southwards towards the natural salt panne feature [2121]. This ditch is notable for truncating a fully articulated horse burial [2489] (2488), one of only two pre-medieval complete animal burials present at Wygate Park. The other burial was of a piglet located in the east terminal of [3018] (2392) the rectangular ditch structure identified in Phase 2.

### **Phase 4** *2<sup>nd</sup> - 3<sup>rd</sup> C AD Settlement* (Fig.11)

#### **The Southern Settlement**

Phase 4 represents the substantial development of enclosure systems, posthole structures and the waterhole. Settlement was polarised at the northern and southern areas of the site with little apparent reuse of the Iron Age area (Figs

11 & 12).

The southern margin of the site revealed two boundary ditches [3050] and [3054]. The ditches curved from southwest to northeast then northwest to the salt panne [2121]. These boundaries were recut several times after completely silting up by ditches [3052], [3055], [3056] and [3057].

Ditch [3065] was one of the earliest features cut within the southern settlement area, located 12m west of the saltpan. Ditch [3065] enclosed an ovoid area approximately 9.5 by 7m, comparable in internal area to the Phase 2 ring ditch [3016] [3019]. In addition [3065] truncated a 2.4m long east west aligned ditch [3063] of undetermined use. Directly west of the ring ditch was a group of postholes sealed beneath a Roman occupation layer (1639) (1730). The postholes suggest several phases of structural use, possibly indicating an area of domestic settlement.

A north south aligned system of linked ditches [3113], [3114], [3115], [3116] and [3117] was located against the western limits of the southern settlement area. The ditches formed a 'ladder' system (Stoertz 1997) in plan, creating internal enclosed spaces between the ladder rungs. The system measured 41 by 16 m (656m<sup>2</sup>) in area creating internal divisions of approximately 110m<sup>2</sup>, possibly used as arable plots.

A curving ditch [3098] aligned north west south east, was cut eight metres east of the ladder system. This formed an open area to the east. [3098] was partially recut by [3094] to redefine the boundary.

An east west boundary ditch [3067], redefined as [3058] in a subsequent recut, truncated the ladder system. This east west boundary was redefined again by [3097] partially truncating [3058] and enclosure ditch [3094].

A later curving enclosure [3074] was cut 6m east of [3098] [3094] forming a similar enclosure and truncating the east west boundary [3097].

South of the posthole area, a three sided ditch system [3109] [3089] was cut, with an open area to the north approximately 300m<sup>2</sup>. [3109] [3089] was truncated by a similar feature [3000] on its southern boundary. Ditch [3000] defined an approximately 360m<sup>2</sup> area bounded on three sides but open to the south. Ditch [3000] also enclosed waterhole [2447] and pit [2473].

Waterhole [2447] measured over 6m in diameter and 1.5m deep with no 'trampling' on its upper edges to suggest animal use (Plate 3). Elongated pit [2473] located 1m directly east of the waterhole measured over 3m long by 0.9m wide and deep and similarly showed no sign of trampling.

A small enclosure area immediately south of the saltern was also located within Phase 4. The enclosure [3040] [3034] formed an internal area of approximately 5m using an existing creek as the southern boundary. As with the posthole/ ditch structures on the saltern this enclosure was modified several times. The enclosure was first recut by [3029] prior to a larger enclosure [3020] being cut. Ditch [3020] formed an internal space of approximately 9.5m again utilising the existing creek. Ditches [3027] and [3031] further modify the enclosure forming a sub circular enclosure approximately 6.5m in internal area. Ditch [3023] aligned north south across the enclosure area was identified as a minor boundary postdating [3020] within Phase 4.

#### The Northern Settlement (Fig. 12)

The northern area of settlement was bounded to the east by a large north south

aligned creek which likely fed the saltern area during the 1<sup>st</sup> century AD. The creek was reworked throughout the Roman and post Roman period. The creek existed as an active feature during the settlement phase, with the triangular ditch system [3170] cut to respect the creek's western edge.

[3170] enclosed an area 28 by 30m (840m<sup>2</sup>). This enclosure was recut by ditch [3175], which represented a significant redefinition of the field system. Ditch [3175] formed an arable system approximately 40m by 36m (1440m<sup>2</sup>) in area. The ditch truncated both the small ditches [3181] and [3183] in addition to enclosure [3199]. Ditch [3175] was later truncated in Phase 5 by [3176] defining an east west division within the enclosure.

Phase 4 revealed several small enclosures cut into pre-Roman silts on the northern settlement. A dendritic branch of the Roman creek system was incorporated in the design of several ditches as a drainage device.

Ditch [3211] was cut into an active creek to the north which subsequently joined the large creek aligned north south. [3211] formed a partial circular enclosure 6m by 5m in area. Directly east of [3211] short curvilinear ditches [3205], [3186], [3187], [3208] and [3210] were again cut into the creek. These ditches appeared to be minor land divisions measuring no more than 10m in length.

A later enclosure [3199] measured 23 by 13m (300m<sup>2</sup>) in area and used the creek as a northern boundary. This enclosure truncated ditch [3187] and likely postdates the other small enclosures in this area.

Two small curving ditches [3181] and [3183] were located 15m south of [3199] and possibly represent animal pens. Both of these ditches were truncated by the large enclosure system [3175].

#### Phase 5 *Mid 3<sup>rd</sup> - 4<sup>th</sup> C AD enclosures (Fig 11 & 12)*

Phase 5 represented the final stage of Roman land use at Wygate Park. Cut features identified from this phase were large enclosure ditches in an irregular ladder system and isolated boundary ditches.

Ditch [3070] forms a curvilinear boundary on the southern area of site aligned northwest southeast for 17m from the modern dyke prior to turning east for 7.5m and draining into salt panne [2121] (Fig. 11). This indicated the continued existence of the salt panne as an open feature being utilised into the 4<sup>th</sup> century AD.

An east west aligned ladder enclosure [3220] was cut across the saltern area, recutting and enlarging several existing saltern and settlement ditches. In addition the enclosure's northern periphery cut into a lower area of land adjacent to the elevated, disused saltern. Ditch system [3220] covered an area approximately 60 by 16m. The subdivided areas in the ladder typically measure between 200 and 250m<sup>2</sup> creating small possible arable plots. The enclosure ditches were substantial cut features, measuring over 3 m wide and 1.2 m deep at their maximum extent (Fig. 11).

Ditch [3219] was 111m long and aligned east west, truncating ladder system [3220]. This ditch forms a late boundary immediately south of the saltern aligned parallel to a modern dyke (Fig. 11).

The final major cut feature in Phase 5 was ditch [3176] aligned east west for 32m in the northern area of site. Ditch [3176] measures 3m wide by 1.25m deep and truncates [3175] an enclosure ditch cut in Phase 4 (Fig 12).

#### Phase 6 *Post Roman flooding*



The pottery came from the following types of feature, in order of size (Appendix 4, Table 1).

The pottery from ditches is fresh at 20.5g per sherd, while that from the water hole is the freshest with a high 50.5g per sherd partly, but not wholly, due to the presence of large mortarium sherds. Notable larger deposits from ditches included in order of least fragmentation are: 0839 (the largest deposit from the site, 446 sherds), 1411, 0783, 0084, and 1532. Other large deposits, but more fragmented, are: 2182, 0556, 2603, 1667, 0666 and 2538.

A notable feature of the pottery is the quantity of very small contexts, 71% of all contexts containing under 10 sherds, while a further 25% are under 50 sherds. This is a limiting factor for dating individual contexts since the smaller the group, the less likely it is to contain diagnostically datable sherds. Many of these can only be loosely dated, often on the presence of Nene Valley grey ware, using the earliest date range for the fabric, mid- to late 2nd century.

A full summary listing of all contexts with quantities, dating and comments is in Appendix 4. This includes notes of sherd links observed between contexts. Many, but not all, are from contexts within the same feature.

#### OVERVIEW OF FABRICS

Pending final checking of the archive database, the fabrics represented are listed in Appendix 4, Table 2.

The most notable feature of the fabrics is the sheer quantity coming definitely from the Nene Valley kilns, comprising the colour-coated, parchment, grey wares and mortaria, accounting for 40-41% of all pottery. It is also likely that a large proportion of the shell-gritted fabrics (SHEL) came from a similar area, a further

30%. Given the date range of the pottery, a proportion of the grey wares (GREY), many in forms later produced in Nene Valley grey ware (NVGW), and most of the cream sherds (CR) could also have a similar source. Thus the main source of the pottery lies in the Nene Valley industry.

While the dating emphasis of the pottery lies in the 3rd century, the quantity of samian at 3% indicates a significant 2nd century activity. This includes some South Gaulish samian, while the Central Gaulish sherds include fresh sherds, with an average sherd weight of 16g. The South Gaulish sherds include a diagnostically early dish form (15/17) but include the decorated bowl form 37, with the possibility that other sherds date to the early 2nd century. Central Gaulish ware includes forms datable to the later 2nd century. Specialist attention is recommended to define the dating evidence.

Other imports include Spanish olive oil amphorae (Dressel 20), while fine colour-coated beakers from Central Gaul and Trier (CGBL, MOSL) also occur. A single body sherd from a closed form from the Hertfordshire Much Hadham kilns is probably of later 3rd century date. Significant early evidence, 1st century, are a few sherds of Gallo-Belgic white wares, including fragments of a butt-beaker. These will need to be checked to be certain they are imports rather than copies made in Britain. Vessels likely to come from more distant sources in Britain include sherds of BB1 from Dorset, and a possible BB2 from south-eastern Britain. Amongst the mass of shell-gritted wares are some sherds probably from the kilns at Bourne.

Most of the mortaria come from the Nene Valley kilns, but the presence of vessels from the Mancetter/Hartshill kilns in Warwickshire of the earlier hooked-rim type, joins the evidence for mid 2nd



century activity, as does a single mortarium (fragments only) from the Verulamium region. There are also two mortarium stamps, one already known from the Nene Valley, the other a fragment only, but on 2nd century hooked-rim types. Specialist attention will be required.

The Iron Age evidence is relatively small, and shell-gritted sherds, which are possibly of Iron Age date, have been separately identified by SHCC, SHCM, SHSF and SHSF codes. These will require more detailed work, and possibly reference to a specialist (D. Knight). There is a major problem with the shell-gritted wares in that a large quantity of the sherds are vesicular, making it difficult to examine the fabrics with any confidence. Moreover hand-made shell-gritted wares occur in both the Iron Age and the Roman period, storage jars in particular being almost exclusively made by hand, irrespective of date. A number of dales ware jar rims occur, all in vesicular fabric; the bodies of such jars are normally hand-made, and body sherds cannot be confidently identified as being from this diagnostic type.

#### OVERVIEW OF VESSEL TYPES

Notable finds include a number of fragments of crucibles, mostly with molten red deposits. There is also a mould fragment, with impressions of a strip of fine decoration (from pit 2171). These will require the attention of a metalworking expert.

An overall view of the vessel forms represented is given in Appendix 4, Table 3. This is based on records with rims only.

This shows the assemblage to be representative of normal occupation debris. In terms of functions, there are problems of interpretation since the jars include vessels in finer fabrics than would

be used for cooking, representing 12-15% of all normal size jars. Most of the wide-mouthed jars are in Nene Valley grey ware, which virtually never show signs of use for cooking. The main cooking vessels are the shell-gritted wares. There is a notable high percentage of dishes, particularly as many of the less identifiable rims designated as bowls or dishes are most likely to be from dishes. A remarkable number of copies of the samian dish form 36 are present, mostly in finer fabrics, and the type represents 30% of all dishes. Beakers are well represented.

Notable vessel types likely to belong to the earlier part of the occupation are the cream flagons and a jug, various carinated vessels, a fragment from a rusticated jar, a possible poppy-head beaker and copies of Gallo-Belgic platters and the samian dish form 18/31. Early sherds from the Nene Valley industry include fragments from rough-cast beakers, and a biberon, a rare vessel, normally considered to be an infant's feeding bottle. Two fragments of cheese-presses also occurred.

#### DATING

A glimpse of the dating evidence for the site as a whole is provided by the individual context dates (Appendix 4, Fig 1).

This shows a peak in the mid to late 3rd century, the secondary peak in the mid to late 2nd century deriving from the smaller contexts dated mostly by the presence of Nene Valley grey ware and/or samian sherds (25% of all contexts). The 2nd century overall represents 24% on sherd count of the context dates. 4th century pottery is largely confined to the deposit in ditch 0839.

#### RECOMMENDATIONS

In view of the earlier Roman and late Iron Age evidence, the samian, which includes eight stamps, should be examined by a specialist to define the dating at both ends of the period. Some of the mortaria will require specialist attention, including two stamps, one a fragment. The small quantity of Iron Age material may benefit from examination by an Iron Age pottery specialist. The crucible fragments and mould fragment will need attention by a metal-working specialist.

As a major Roman site in South Lincolnshire, a full illustrated report is essential. Due to the size of the site, vessels for drawing have been necessarily selected during archiving, totalling 225 drawings with 14 possibly to be drawn. These will need to be examined to select those for publication. It may be advisable to publish the major group from ditch 0839 as a group (45 drawings), the rest as a type series. In view of the variety of shell-gritted wares, further work may be necessary to define the sources. Analysis of the pottery by function is recommended.

## 2.5 Roman Coin Assessment

### Roman Coins from Spalding Wygate Park by Dr Steve Malone

SF 9 (0396)

Trajan, *sestertius*, 103-114? Obv: IMP TRAIANO A]VG GER DA[C P M TR P COS VI P P?

Laureate (draped?) bust, right

Rev: standing figure (Felicitas, Libertas, Pax?) [...] S [C]

Diam: 30mm Wt: 11.2g Axis: 7  
Wear: W/W

(0452)

Corroded *denarius* Obv: bust, right

Rev: -

Diam: 19mm Wt: 2.0g Axis: -  
Wear: C

(0457)

Corroded *denarius* Obv: bust, right

Rev: -

Diam: 19mm Wt: 2.0g Axis: -  
Wear: C

A sample of 3 provides little room for comment. The *sestertius* shows considerable wear, and the type could have remained in circulation until c. 260. The *denarii* are corroded but what little can be discerned of the busts (and the high relief of 0457) suggests 2<sup>nd</sup> (or possibly late 1<sup>st</sup>) century date. These too could have circulated until the beginning of the third century. The *denarii* are relatively high value coins for a rural settlement. Given that there are any coins at all, the absence of any of the very common 4<sup>th</sup>-century copper might be telling us something (although that might just be something about preservation and/or retrieval).

X-rays might allow better identification of the corroded coins but could only provide a *terminus post quem* even if well stratified.

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## 2.6 Metal Working Assessment

### Industrial Materials And Fire Residues by Gary Taylor

Recording of the industrial materials was undertaken with reference to guidelines prepared by English Heritage (Jones 2001)

and the collection was quantified by count and weight. An assemblage comprising 1149 objects weighing 29354g was recovered.

### **Provenance**

The material was recovered from a range of ditches, pits, postholes, spreads and the water hole, predominantly within Phase 4.

The highest concentrations of crucibles and smithing slag were retrieved from two distinct areas on the southern settlement. One concentration was located towards the north of the southern settlement and was retrieved from the fills of ditches and pits including [3097] and [3094]. The second higher concentration of smithing material was retrieved from the rectangular ditch structure [3016] [3019] (Fig. 11).

### **Crucibles**

Twenty-two crucible fragments were recovered and most have a red colouration or glaze (Appendix 5, Table 1). This colouration has previously been observed on crucibles used for copper alloy melting, for example, at Ribchester (Starley 2000, 340) and Worcester (Taylor 2004, 385) and it is probable that the same metal was being re-cast here at Spalding. Apparently confirming this is one of the crucible fragments from (2208) that has a green cuprous encrustation on the interior. Most of the crucibles appear to have been in a thumb-pot or baggy form, though one appears to have been a shallow saucer. One straight-edged rim sherd may be from a triangular crucible. These latter types originate in the Iron Age but frequently occur in Roman period deposits (Starley *ibid.*). The saucer forms are scarce but have been found in Roman deposits previously (Taylor *ibid.*). By contrast, the small baggy forms of crucible are the commonest form and occur in Iron Age deposits at Dragonby (Thomas and May

1996, 315-7) and Roman layers there and elsewhere.

### **Potential**

This is an appreciable collection of crucibles and has high site-specific potential and significance.

### **Recommendations**

Form sherds should be drawn. Qualitative analysis of residues is worthwhile to determine alloy types.

### **Industrial residue**

Fuel ash slags (Appendix 5, Table 2), produced in high temperature fires in which alkalis and silicates are in contact (Jones 2001, 21), occurred in abundance. There is a transition between fuel ash slags and vitrified hearth lining and numerous pieces of both residues have characteristics of each type. Fuel ash slags and vitrified hearth lining are not necessarily produced by metallurgical activity.

Other than the fuel ash slags and vitrified hearth lining, all the industrial residues, where definable, are associated with iron smithing.

Note, material described as 'indeterminate iron slag' is not undiagnostic iron slag and may not be slag at all, but possibly decayed objects or ferrous concretions.

### **Potential**

As a large and diverse assemblage of material, this collection has high site-specific potential and significance.

### **Recommendations**

Associations between different types of industrial residue, crucible, fire waste and metals should be examined in an attempt to identify functional area on the site and

relationships between different categories of material.

### **Fire residue**

Other than providing functional evidence, the collection of fire waste is of limited local potential (Appendix 5, Table 3).

### **Recommendations**

Correlation of associations should be undertaken to determine if the fire wastes relate to any type of high-temperature activity indicated by the industrial residues and artefacts. Where such associations can be confirmed then examination of the relevant charcoal pieces to establish fuel type would be useful.

### **Condition**

All the material is in good condition and presents no long-term storage problems. Archive storage of the collection is by material class.

### **Documentation**

There have been previous archaeological investigations at Spalding, including at the current site and nearby, that are the subjects of reports. Details of archaeological sites and discoveries in the area are maintained in the Lincolnshire County Council Sites and Monuments Record.

### **References**

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## **2.7 Faunal Remains Assessment**

### **ASSESSMENT REPORT ON THE ANIMAL REMAINS**

*By Jennifer Kitch*

#### **Introduction**

A total of 9507 (87427g) fragments of animal bone were recovered by hand during archaeological excavation at Spalding Wygate Park, Area A. Many of the remains were highly fragmentary and were able to be refitted, reducing the overall fragment count to 4627 fragments. For the purposes of this assessment the entire assemblage has been fully recorded onto a database archive.

#### **Methodology**

Identification of the bone was undertaken with access to a reference collection and published guides. All animal remains were counted and weighed, and where possible identified to species, element, side and zone (Serjeantson 1996). Also fusion data, butchery marks (Binford 1981), gnawing, burning and pathological changes were noted when present. Ribs and vertebrae were only recorded to species when they were substantially complete and could accurately be identified. Undiagnostic bones were recorded as micro (rodent size), small (rabbit size), medium (sheep/pig size) or large (cattle/horse size).

The separation of sheep and goat bones was done using the criteria of Boessneck (1969) and Prummel and Frisch (1986), in addition to the use of the reference material. Where distinctions could not be made, the bone was recorded as sheep/goat.

The condition of the bone was graded using the criteria stipulated by Lyman (1996), Grade 0 being the best preserved bone and Grade 5 indicating that the bone had suffered such structural and attritional damage as to make it unrecognisable.

The quantification of species was carried out using the total fragment count, in which the total number of fragments of bone and teeth was calculated for each taxon. Where fresh breaks were noted, fragments were refitted and counted as one.

Tooth eruption and wear stages were measured using a combination of Halstead (1985), Grant (1982) and Levine (1982), and fusion data was analysed according to Silver (1969). Measurements of adult (fully fused) bones were taken according to the methods of von den Driesch (1976), with asterisked (\*) measurements indicating bones that were reconstructed or had slight abrasion of the surface.

## Results

### Condition

The condition of the hand collected bone was good to moderate, averaging between grades 2 and 3 on the Lyman criteria (1996). Table 1 (Appendix 6) summarises the range of condition grades noted within the assemblages within each site. The relatively good condition of the bone suggests good potential for the recording of butchery, gnawing and pathologies where present. Additionally the levels of preservation suggest good potential for the preservation of the more fragile remains

such as foetal and juvenile remains, micro species, birds and fish. Due to the small nature of these remains, these types of bone fragments are often under represented within hand collected assemblages and therefore are often collected within the residues of the environmental samples. The good to moderate preservation suggests good potential for these remains to be represented within the sieved collected assemblages.

Table 2 (Appendix 6) summarises the number of fragments identified within the assemblage as butchered, burnt, gnawed, measurable and worked. As can be seen, the main concentrations are based within the two settlement phases 1 and 3. This is especially true within Phase 4, which yielded the biggest assemblage. Further analysis specific to the spatial distribution may highlight specific activity areas within the site.

### Species Representation

Table 3 summarises the number of fragments of bone identified to species or taxon from each individual site. The main domesticates dominate the assemblage, with a predominance of cattle, followed by sheep/goat (goat was not positively identified within the assemblage). *Equids* (Horse/donkey) are the next predominant species within the assemblage, followed by pig, domestic fowl and dog. Small numbers of bird, *cetacea* (whale/porpoise), red deer and water vole were also identified within the assemblage.

Several complete and partial skeletons have been identified within the assemblage, marked \* within the table. The presence of these complete and partial burials within the assemblage may skew the relative abundances of the identified species and therefore minimum number of individuals calculations should be made to assess the true nature of the animal husbandry practices.

### *Contexts of Interest*

#### *Iron Age Enclosure Phase 2 (groups 3014, 3016, 3018)*

The enclosure ditch contained a number of animal bone fragments which may have represented food and butchery waste. As this feature appears to be associated with iron smithing (Taylor appendix 5) and fragments of bone have been recovered, there is a potential for the use of animal bone as an additional fuel source. Within the terminal end of the enclosure ditch (group 3018) was a partial piglet skeleton. The truncated skeletal remains of the piglet skeleton were discovered within a pit (group 3016) cutting the terminal end of the enclosure ditch.

#### *Saltern Contexts Phase 3*

The animal remains recovered from the saltern contexts are not as abundant as the settlement phases. The remains are generally from the main domesticates with several cases of butchered bone and a number of burnt bone, possibly remnants of domestic/food waste. Further analysis of the animal bone associated with the saltern activity may provide insight in to any potential meat preserving/salting taking place.

A complete horse burial was recovered from this phase, although little evidence to the nature of the animal's deposition is apparent. The skeleton displayed possible cut marks on the rear lower limbs.

#### *Water Hole Phase 4 (2447)*

The waterhole assemblage contained a complete juvenile equid skeleton with a few fragments of adult equid remains. In addition there was a partial piglet skeleton, a dog tibia, cattle tooth, tibia and radius and a sheep/goat metacarpal, metatarsal and scapula. The assemblage appears unusual for pure refuse disposal. Further analysis of the assemblage in conjunction with the accompanying finds may provide

further insight into the nature of the deposit.

#### *Human Remains (1311) and (2873)*

Limb bones from human neonates have been recovered from the assemblage. Due to the nature of burial of very young children in Romano-British contexts, the presences of these remains are not unexpected.

### **Discussion and Potential**

The Wygate park assemblage is of a relatively large size and has good potential for further analysis. The remains from the settlement Phase 4 especially shows good potential for the analysis of husbandry practices and animal utilisation on site.

There appears to be a slightly inflated number of equid remains than would be initially expected from a "typical" Romano-British settlement assemblage. Further analysis is required to assess this perceived abundance in equid remains.

The assemblage contains a number of mandibles suitable for the provision of tooth wear score ages, with good potential for producing age-at-death profiles for establishing indications of husbandry practices on site.

Infant and juvenile remains have been noted within the assemblage for cattle, sheep/goat, pig and equid, suggesting the potential breeding of these animals on site. Due to the varying nature of the activities taking place on site, further analysis of the spatial arrangements of the assemblages and in depth analysis of deposits including associated finds to potentially identify different activity areas.

The hand collected assemblage appears to contain little in the form of wild animal resources. Some of the bird remains require further confirmation of species. However, the utilisation of wild species

seems to be rather limited. This may be an effect of collection bias, due to the small size of many wild faunal remains (fish, waterfowl, eels etc.). Analysis of the remains from the sieved assemblages may provide further insight into the utilisation of wild resources. Micro fauna may also provide further data on the local environment.

### Recommendations

- Calculations of minimum number of individuals from the assemblages to calculate accurate abundances of each species, removing bias caused by the presence of partial/complete skeletons.
- Analysis of materials with full context data will provide information on activity areas and potential placed or 'special' deposits.
- Analysis of bone assemblages associated with the saltern to assess the potential for salting/preserving meat on site.
- Tooth wear and epiphyseal aging data analysed to assess potential husbandry strategies, where available.
- A comparison to other similar assemblages regionally and nationally, where data is available, especially in respect to the perceived increase in equid remains identified. Similar cases have been noted within assemblages from Cambridgeshire (Baxter and Higbee, Pers.Comm).
- Addition of any remains recovered from any environmental bulk samples to produce a more accurate

representative assemblage of the animal utilisation and environmental indicators.

- Analysis of the age and context of the human neonate remains may provide further information on the more human aspects at Wygate Park.

Jennifer Kitch

Archaeological Project Services

April 2006

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## 2.8 Briquetage Assessment

### Wygate Park Area A Briquetage Assessment by Tom Lane

#### *Introduction*

Briquetage and associated salt production features were excavated at Wygate Park, Spalding, Lincolnshire as part of a planning condition in advance of housing development. Excavation was undertaken between June and December 2005. The excavated saltern features indicate regular rebuilding of the hearths and settling tanks. The waste briquetage was used as hardcore to elevate the working area around the hearth/ovens and as floors in the associated post built structure.

#### *Factual Data*

##### *Quantity of material*

In the region of 16000 pieces of briquetage weighing c 180 kg were retrieved during

the excavation, along with several thousand small (<5mm) fragments from Finds Samples. More material will become available following the processing of environmental samples. Briquetage was retrieved from 554 contexts (Appendix 7, Tables 1 & 2).

#### *Provenance*

Briquetage came from a variety of features associated with salt production including the hearths and associated settling tanks, the ditch surrounding the working area, associated creek fills, various dumps and from the floor makeup and post holes of an adjacent contemporary post-built structure. Material was also retrieved from pits and ditches of a Roman settlement that grew up around the saltern, seemingly after the active salt production phase had concluded.

#### *Range and Variety of Material*

A wide range of form types are present in the assemblage, although there are only a few complete examples. Pedestals include square-sectioned tapering examples (PD8-type). Brick supports include form BK1 (complete example from cxt 289). Slabs were present both in the Area A and Phase 9 excavations. In Phase 9 a number of the slabs were perforated, a trait seen also in Area A, though in lesser numbers. A complete, unperforated, slab (which has cracked and broken during subsequent drying) was located seemingly in situ in the flue of a hearth/oven. A variety of miscellaneous, presumably structural material was present. Fragments of hand-squeezed objects that may have been pedestals or rods/bars were present. These include 'cigar-shaped bars' BR1.

Container sherds were present in large numbers although rims were a comparative rarity. A number of base/wall joins were noted, some from vessels with straight sides (in plan) and others from rounded



corners. These latter examples resemble the flat-base pans from Morton and in particular Fig 32 No 5 in Lane and Morris (2001). Containers were almost exclusively vegetation tempered, but with a small group from the northern part of the site, away from the main saltern, being shell/small stone tempered and slightly thicker (around 14mm as opposed to the c. 10mm of the majority of those measured).

One briquetage form that is all but absent from both Area A and Phase 9 is the stabilising clips.

Material from finds samples has been retained but it should be noted that these whole earth samples were taken for artefact retrieval and sieved through a 5mm mesh. This has meant that the <5mm fraction has already been discarded, but such a small size would not have added to artefactual studies. The finds that come from the environmental samples, including those from the floors of the structure, will be better represented in terms of piece size.

#### ***Condition of the material***

With the exception of the complete slab most of the material is in good condition and not in need of conservation.

#### ***Statement of potential***

Detailed study of the briquetage is recommended on the grounds of the completeness of the excavation record. Detailed full excavation of this multi-phased saltern complex, comprising hearth/ovens, settling tanks, working floors and associated structure, will enable the recovery of a near complete record of this type of industrial site. While interpretation of the primary use of the different types of objects should be possible a secondary use, primarily as hardcore, can be deduced. This enables the possibility of determining preferences for

the re-use of certain objects in particular ways. For instance, a number of the postholes of the associated structure yielded only container sherds, a preference also noted on Phase 9. Moreover, features in the settlement with ditched paddocks, which developed adjacent to the site, contained briquetage enabling further study of the movement of briquetage around the site and its secondary use.

The detailed environmental analyses, along with scientific dating, should enable the reconstruction of the landscape in which the saltern and the subsequent settlement operated, including its water source and the strength. Integration of the environmental data will enhance the artefactual evidence.

The Fenland area is key in understanding late prehistoric and Roman salt production and work there to date has been extensive, providing an added Group Value element to the work. A number of sites in the area have already been excavated and the briquetage studied (Lane and Morris 2001).

#### ***Storage and Curation***

Examples of all the main individual briquetage forms and fabric types should be illustrated and retained. Redeposited briquetage may be considered for discard after recording. Material from samples should be scanned only with any key pieces retained. Most of the material from the artefactual samples (described as misc frags in the table) will eventually be discarded.

#### **References**

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## 2.9 Other Finds Assessment

### The Other Finds by Rachel V Hall & Gary Taylor

A large, mixed assemblage of finds was recovered. Each different type of material was quantified by count and weight. A total of 358 artefacts weighing 38279g was recovered.

The excavated molluscan assemblage comprises 41 shell fragments weighing 206g. Species were identified by reference to published catalogues.

#### Provenance

The material was recovered from a wide range of deposits including Romano-British cut features, creeks and post medieval dykes. In addition material gathered from fieldwalking the southern settlement prior to final machine stripping was included for assessment.

#### Metalwork

##### Potential

As a mixed assemblage of varying dates the collection of metals has only moderate potential in general terms, though some of the items provide dating and functional evidence (Appendix 8, Table 1).

##### Recommendations

Certain of the artefacts should be cleaned and conserved, including both brooches. Additionally, the indeterminate iron objects should be X-rayed, as should the strap end, the amorphous piece from (1347), the possible blade tang and the iron C-shaped loop. Following cleaning and X-raying these artefacts should be re-examined. The brooches, strap end, spindle whorl, and C-shaped loop should be drawn. The obviously recent artefacts could be discarded.

### Ceramic Building Material & Fired Clay

#### Potential

With one exception the ceramic building materials are late post-medieval to early modern and of very limited local potential but provide some dating evidence (Appendix 8, Table 2). Parts of several confirmed or probable loomweights were recovered, of which one was triangular. Loomweights of this form occur widely on Iron Age sites across southeastern Britain but not north of the Humber. In general they are found to date after about 500BC but at Dragonby in North Lincolnshire weights of this type tended to occur in Late Iron Age or early Roman contexts (Elsdon and Barford 1996, 330).

#### Recommendations

Although the daub should be retained, all the other pieces of ceramic building materials could be discarded.

#### Worked Bone

A small quantity of worked bone was recovered. A fragmentary hairpin from (595) is typical of Roman examples elsewhere and is near identical to one found at Lincoln (Mann 1982, fig 5). Part of a probable single-piece handle was recovered from (2171). Very closely comparable to one found in Colchester (Crummy fig 110, no 2925), this is probably from a knife. However, this Spalding piece is very short and there is evidence of polish/wear at either terminal, indicating it was either short originally, or reworked.

A double-ended pin-beater was found in (1347). Used in weaving in association with the warp-weighted loom, double-ended pin-beaters occur commonly on Anglo-Saxon sites but are superseded by

single-ended ones in about the 10<sup>th</sup> century (MacGregor *et al.* 1999, 1967).

A socketed point from (838) is a type of implement that is found frequently, though they are of uncertain function. A possible use as gouges for leather-working has been suggested (Mann 1982, 31) and they occur widely in deposits of 9<sup>th</sup> to 14<sup>th</sup> century date (MacGregor *et al.* 1999, 1989).

A square bone panel from (199) is similar to a weaving tablet, though such implements have holes at the corner, whereas this only has one at the centre. It may therefore be a decorative mount. A worked antler from (4304) has had the burr removed and has been cut at the junction of a secondary tine, with that tine also removed. The function of this implement is unclear and it could date from the Roman to late medieval period.

#### **Potential**

As a mixed assemblage of varying dates the artefact collection is only of moderate potential in general terms, though some of the items provide dating and functional evidence (Appendix 8, Table 3).

#### **Recommendations**

All the worked bone should be drawn. The recent, 20<sup>th</sup> century, material could be discarded.

#### **Stone**

Fragments of several quern stones, in total 22 pieces, were recovered (Appendix 8, Table 4). Amongst these is a complete profile from about one-third of a beehive quern, from (2300).

There are also several flat or rotary quern topstones, from (071), (781), (894), (1091), (2192), (2449) and (2927), the latter two and that from (894) incorporating part of the central

eye/hopper. A very large quern from (1537) is probably a flat quern bottom stone and is similar to other substantial bottom stones found at Baldock, Hertfordshire (Foster 1986, fig 79, nos 802-4). A complete flat quern bottom stone was also recovered from (1492). Other fragments of quern, from (085, 894, 1301 and 2927) lack discriminatory features and could be either bottom stones from beehive querns or top or bottom stones from flat rotary querns. Most of the querns appear to be of Derbyshire gritstone.

#### **Potential**

The querns denote food-grinding activities at the site and are of moderate site-specific potential. Most of the other stone only provides some functional evidence, and needs to be considered alongside other artefacts to determine potential, though is likely to be of only low-moderate site-specific potential.

#### **Recommendations**

The querns should be drawn. Examination of the querns by a geologist to determine stone types may be useful as a guide to trade.

A very large quantity of natural stone was also recovered (Appendix 8, Table 5). This has no obvious potential and could be discarded.

#### **Molluscan Assemblage**

Two groups of largely intact *Scrobularia* shells, probably *Scrobularia plana*, were recovered, from contexts (610) and (734) (Appendix 7, Table 6). Scrobulariidae are burrowers, living in the mud of salt marsh channels, tidal estuaries and other brackish environments (McMillan 1973, 93). These shells are probably environmental indicators and help to define the nature of the deposits where they were found. One

of the groups, (610), is associated with a banded snail, *Helix nemoralis*, or perhaps *Helix hortensis*. These very similar terrestrial species are widespread, including in sandhills (*ibid.* 125).

Most of the other mollusc shells are food waste, with a distinct concentration on oysters. One of the oysters has had a panel cut from it, and another may also be deliberately cut. Such excision of panels from oyster shells is not uncommon, though the reasons for it are uncertain. It is possible that this deliberate cutting of shells was to obtain small panels of mother of pearl for decorative purposes, or perhaps to wear the shell as a pendant or attached to a garment (Cartwright 1996, 540).

#### **Potential**

The molluscan assemblage is of limited site-specific potential but provides some environmental and dietary evidence.

#### **Recommendations**

All the mollusc shells should be retained. A faunal specialist should confirm identification of the probable Scrobulariidae.

#### **Condition**

All the material is in good condition and presents no long-term storage problems. Archive storage of the collection is by material class.

#### **Documentation**

There have been previous archaeological investigations at Spalding, including at the current site and nearby, that are the subjects of reports. Details of archaeological sites and discoveries in the area are maintained in the Lincolnshire County Council Sites and Monuments Record.

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#### **2.10 Waterlogged Wood Assessment**

**Waterlogged Wood From Spalding Wygate Park 20062 SWP05 by Maisie Taylor April 2006**

#### **The Waterlogged Wood**

#### **Quantity of material**

There is a shoe and part of a shoe, 15 pieces of wood, which have been

examined in detail and a small quantity of round wood (Appendix 9).

#### **Provenance**

The wood and leather was retrieved from two contexts; 838 and 1452.

#### **Range and Variation**

Most of the wood is worked and there are a high proportion of artefacts.

#### **Condition of Material**

Using the scoring scale developed by the Humber Wetlands Project (Van de Noort, Ellis, Taylor and Weir 1995 Table 15.1) most of the material scores 4 or 5 (Appendix 9).

#### **Statement of potential**

Material is derived from three categories.

#### **Artefacts**

4 artefacts have been examined in detail and one has gone straight to the conservation laboratory

#### **Timber debris**

The timber debris are all 'off-cuts' with evidence for various joints and wood-working techniques.

#### **Roundwood**

Eight pieces have been examined in detail. All are trimmed and one has a tenon cut in one end.

#### **New research questions and potential of data**

The assemblage is unusual in a number of ways: There is a high proportion of

artefacts, and a better than average quality of preservation. Material of this date and quality is very rare in the area. Also, some of the material examined in the field appeared to be ash wood (*Fraxinus excelsior*), which would be fairly unusual on a fen site. The samples need to be microscopically examined for species identification.

#### **Recommendations**

Some of the material still needs to be examined or re-examined. There are 17-20 samples for species identification. The final report should be quite straightforward, except some time is needed in the library to search for parallels.

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### **2.11 Environmental Assessment**

#### **Spalding, Wygate Park – SWP05 Environmental Archaeology Assessment Report**

#### **Introduction**

Excavations conducted by Archaeological Project Services in advance of a residential development at Wygate Park, Spalding, revealed evidence of Iron Age and Roman saltern and settlement activity. A large number of samples have been collected from the site to address the environmental questions (Appendix 10, Table 1). In addition an auger transect was laid out across the site and the results of the augering have been used to help identify the sedimentary history of the site.

The sampling has been targeted to address questions concerning the chronology, environmental history and palaeoeconomy of the site in conjunction with the work being carried out on the adjacent site at Wygate Park, Phase 9 (Martin *et al* 2006). For the purposes of this assessment a selection of twenty nine of the bulk samples has been processed (Appendix 10, Table 2) and assessed, and the preliminary analysis of the borehole data is presented.

The site is divided into four areas of activity, and samples have been selected from each for assessment (Appendix 10, Fig. 1). These comprise an area of Iron Age activity, a complete Romano-British Saltern, and a northern and southern area of Romano-British settlement.

### Methods

The soil samples were processed in the following manner. Sample volume and weight was measured prior to processing. The samples were washed in a 'Siraf' tank (Williams 1973) using a flotation sieve with a 0.5mm mesh and an internal wet-sieve of 1mm mesh for the residue. In instances where preserved organic remains were expected a flotation sieve of 0.3mm and wet-sieve of 0.25mm was used. Both the residues and non-waterlogged flots were dried and the residues subsequently re-floated to ensure the efficient recovery of charred material. The dry volume of the flots (wet for waterlogged) was measured and the volume and weight of the residue recorded. A total of 529.5 litres of soil was processed in this way.

The flot of each sample was studied under a low power binocular microscope. For ease of sorting the dry flots were poured through a stack of sieves (>6.7mm, 2mm and 1mm). Where appropriate, the wet flots were sub-sampled and portions of the coarse (>2mm) and fine (<2mm) fractions were assessed. The presence of environmental finds (i.e. snails, charcoal,

carbonised seeds, bones etc) was noted and their abundance and species diversity recorded on the assessment sheet. The flot was then bagged. The flot and finds from the sorted residue constitute the material archive of the samples.

The individual components of the samples have been preliminarily identified and the results are summarised below by site in Tables 3 and 4. Botanical nomenclature follows Clapham *et. al.* (1962).

### Results

The results of the assessment are presented by area in Tables 3 and 4 (Appendix 10). Archaeological finds from the samples include pottery, glass, iron objects, fired earth and briquetage, hammerscale and slag, fuel ash slag, animal bone, marine shell and a worked bone counter.

Briquetage and fired earth deposits are, not surprisingly, concentrated in the Saltern, although features from the southern settlement have also produced probable briquetage. Slag and fuel ash slag occur in a number of the samples, with the latter occurring in most of the saltern samples but iron smithing slags are also present.

Most of the slag is silica rich small cindery pieces, a few of which are magnetic. How much of this is Fe cinder is unclear. The only hearth bottoms are small and from 2207 (sample 132), a context that also includes large fresh pieces of plate hammerscale. This is clearly the by-product from an iron smithy and is probably a primary dump directly from the forge. Hammerscale and smithing slags (although only in the form of Fe cinder) were also recovered from 2336 (144) and to a lesser extent 2412 (148) and 2741 (157).

Pieces of fired clay are present in most of the larger groups, both oxidised and reduced fired. All the clay in 2741,

however, is reduced fired, including the possible tuyere with attached iron slag, which is unusual. The quantity of cinder and the generally cindery nature of all the slag suggests very little iron was lost in the smithy hearth but that silica (sand) was perhaps entering it with the fuel. Some of the cinder may be the result of some other high temperature process, much is too large to be ordinary fuel ash slag, which can be produced in a domestic hearth. The hammerscale is concentrated in just three contexts, 2207, 2336 and 2412, although present elsewhere on the site. These three samples are associated with a square ditch feature in the south-west corner of the site (Appendix 10, Fig. 1) and these concentrations of hammerscale and slag in the samples are clear evidence of an iron smithy.

It is possible that this ditch feature represents the smithy and analysis of further samples from the southern settlement might be expected to show further concentrations of hammerscale in this area. Iron smithing must also have been conducted at the northern settlement where hammerscale and Fe cinder have been found in the boundary ditch, but the concentrations are much lower and the location for the smithy cannot be postulated.

Animal bone has been recovered from most of the samples. The following taxa have been identified - horse, cattle, sheep/goat, pig, small bird, small and medium sized fish, stickleback, eel, shrew, field vole, water vole, house mouse and frog/toad. Of the domestic and economically important animals sheep/goat occur most often (11 samples), with cattle in only five and pig and horse in one. Eel vertebrae were present in three samples and the size of some of the other fish bones suggests that they derive from dietary waste, although the small stickleback spines could easily derive from fish remains in the marine silts or fishes

living in the ditches. The presence of house mouse in two of the samples suggests the proximity of buildings, while the shrew, water vole and field vole probably indicate a local grassland environment with the ditches water filled.

Marine shell and bird eggshell were found in only two samples each. The marine shell includes fragments of mussel and cockle, the bird eggshell has not been identified.

The snails have not preserved well on the site but a few samples have produced shells. These include shells of *Cecilioides acicula*, a blind burrowing snail which is probably intrusive in the deposits, but the shells of *Vertigo pygmaea*, *Vallonia excentrica*, *Vallonia costata*, *Cepaea nemoralis*, *Trichia hispida*, *Cochlicopa* sp., *Vitrea* sp. and *Aegopinella pura* are all likely to be contemporary with the deposits in which they were found. This suite supports the small vertebrate evidence in also suggesting an open grassland habitat although the latter two taxa tend to be found in more shaded environments. There is an absence of aquatic taxa in these samples but whether this is an artefact of survival or due to other reasons cannot be established at this stage.

Several of the samples included well preserved waterlogged remains (Appendix 10, Table 4) which apart from the botanical evidence which is discussed below includes animal hair, wood, insects, water fleas, etc. The waterlogged remains are specifically associated with the deeper features on the northern and southern Romano-British settlements and the ditch around the saltern. Features like the large pit, samples 150 and 160, in the southern settlement have a series of waterlogged samples likely to indicate the character of the debris being thrown in.

Four kubiena samples have been collected from deposits associated with the saltern structures. These have been taken to establish whether the micromorphological characteristics of the sediments infilling the settling tanks can give any clue as to the manner in which they functioned.

#### **Archaeobotanical Remains (Gemma Martin)**

Of the nineteen dry flots, a total of eighteen yielded charred plant remains in the form of cereal grains, chaff and wild (weed) seeds, as well as charcoal. In addition, nine of the ten waterlogged flots also contain charred plant remains, including cereal grains, chaff and weed seeds, as well as anaerobically preserved weed seeds and plant vegetative material (Appendix 10, Table 4). For the purposes of this assessment only a small proportion of the waterlogged flots were assessed, with estimations of the abundance of both charred and anaerobically preserved remains then made and indicated accordingly in Table 4 (Appendix 10). A number of the dry flots also contain uncharred weed seeds, which have been recorded but excluded from any discussions, as it is not certain at this stage of assessment whether these are archaeological or modern intrusions.

The state of preservation of the charred plant remains is variable. The processes of carbonisation have preserved some remains poorly in a number of instances, preventing identification even to genus, but well in others, as attested by the presence of well-preserved delicate chaff components in a number of the flots. The state of preservation of the anaerobically preserved remains is also variable and in many instances the preserved plant vegetative material appears to be rather degraded with limited species diversity recorded in the weed seed assemblages. The results from the flots will be discussed by Area (see below).

#### **Iron Age**

Only small quantities of charred plant remains have been recovered from the five samples associated within the Iron Age area (Appendix 10, Table 4). The cereal assemblages indicate that a small amount of charred cereal is entering the archaeological deposits, possibly wheat (*Triticum* spp.), based on the presence of a single wheat glume base of a glume wheat species (such as *Triticum spelta* – spelt wheat or *Triticum dicoccum* – emmer wheat). The weed seeds assemblages are equally small and include species broadly associated with damp or wet areas such as spike-rush? (cf. *Eleocharis* spp.), club-rush? (cf. *Scirpus* spp.) and sedges (*Carex* spp.). The archaeobotanical remains provide very limited evidence and it is difficult to characterise the nature of the assemblages and infer anthropogenic activities due to the small quantities of remains retrieved from the flots.

#### **Northern Settlement**

A total of four samples were selected for assessment from deposits associated with the Northern Settlement, of which, two disparate samples (samples 3 and 154) proved to be rich in archaeobotanical remains. Sample 3, the fill (85) of the large enclosure ditch [?] is particularly abundant in charred cereal, chaff, weed seeds and uncharred seeds. Likewise the fill (2658, sample 154) of creek [2642] is also fairly rich in charred grain, chaff and weeds as well as containing an abundance of anaerobically preserved weed seeds.

Wheat occurs with the greatest frequency overall in terms of the cereal grain and chaff assemblages, with species provisionally identified including possible spelt (*Triticum* cf. *spelta*) and emmer/spelt (*T.* cf. *dicoccum/spelta*) type wheat. Traces of barley (*Hordeum* spp.), including six-



row hulled barley (*H. vulgare* var *vulgare*), are present in the form of very small amounts of grain and chaff, and grains of oat (*Avena* spp.) are also present in sample 3.

The weed seed assemblages include species broadly associated with arable land such as vetch/vetchling (*Vicia/Lathyrus* spp.), dock (*Rumex* spp.), cleavers (*Galium aparine*), field gromwell (*Lithospermum arvense*), stinking mayweed (*Anthemis cotula*) and large grasses like brome (cf. *Bromus* spp.) and oat. Damp or wet habitats are also indicated by the presence of water crowfoot (*Ranunculus* Subgenus *Batrachium*), horned pondweed (*Zannichellia palustris*), spike-rush? (cf. *Eleocharis* spp.), club-rush? (cf. *Scirpus* spp.) and sedges (Cyperaceae). These weed assemblages appear to reflect both the local environment of features and, particularly in terms of the charred remains, domestic activities such as those relating to crop processing.

Domestic waste, which may include crop processing residues, certainly appears to have been discarded into the fill of the large enclosure ditch [?] (sample 3), and also appears to have been incorporated to a lesser degree into the fills of the boundary ditch [?] and enclosure ditch [?] (samples 157 and 159 respectively). Interpreting the concentration of charred plant remains from the fill of creek [2642] is more problematic, taphonomic processes need to be taken into careful consideration since the material may have washed in from a range of sources, as opposed to the deliberate disposal of domestic residues into the creek. If the concentration of charred remains in creek [2642] is not the result of the direct disposal of waste into it, but is a product of incidental accumulation, then the focus for domestic activity appears to be primarily within the vicinity of the large enclosure ditch

(sample 3) and further analysis should help to elucidate this.

### Saltern

A total of seven samples were selected for assessment from the area of the Saltern. The poor state of preservation of the charred cereal grains prevented identifications being made even to genus in all but one sample. On the occasion where the cereal grains could be identified at least to genus, wheat and oat were identified. Wheat does occur with greater frequency in terms of the chaff assemblage. Remains of barley have not yet been encountered from the saltern deposits. The majority of the chaff recovered from the flots appears to be that of a glume wheat species, such as emmer or spelt wheat, and a small quantity of oat chaff in the form of the diagnostic awn fragments were identified in one sample (sample 152).

In spite of the small sample volume, sample 152 produced the second largest flot (1116 millilitres) of the entire assessment group. Aside from the abundance of charred cereal chaff and weed seeds, the flot also contains pieces of worked wood, and an abundance of compressed plant vegetative material with 'large grass-sized' culm nodes and internodes which may perhaps be straw, although further analysis is required to confirm this. The location of ditch [2247] appears to be on the periphery of the saltern, not situated far from the area of the Southern settlement and further analysis is required to establish whether the remains are associated with industrial activity, with the chaff and weed seeds being used as fuel or kindling, or if the assemblages are associated with the settlement activity.

The remaining six samples provide limited economic information with only sample 120, from a layer of briquetage, possibly yielding some information relating to the local environs.

In terms of charcoal suitable for identification and further analysis, there are small quantities from posthole [235] (sample 15) and from enclosure ditch [152] (sample 152), although there are not sufficient quantities from the hearth(s) or layer of briquetage which would have provided more direct information relating to fuel sources used for the salt production.

### **Southern Settlement**

The greatest number of samples selected for assessment originates from the Southern settlement, amounting to fourteen samples in total. The earliest features sampled from the Southern settlement are the square ditch feature [2410] and pit [2335] (samples 132, 144 and 148 respectively) and date to the late Iron Age/early Romano-British period. The flots from these features are sparse in terms of archaeobotanical remains, containing unidentifiable cereal grain and small weed seed assemblages that provide no indication of the function of pit [2335] or the square ditch feature. Based on the evidence so far, it appears that domestic activities were not associated with these features and the charred plant remains may represent 'background material'. Charcoal dominates the large flots from samples 144 and 148 and considering the interpretation above that these deposits are associated with iron smithing this probably represents the fuel used in the smithy hearth.

Sample 78, the fill of enclosure ditch [1024], contains an abundance of charred grain and weed seeds and some cereal chaff, suggesting that residues from crop processing activities were being discarded into the ditch. The two samples from the fills of the large 'water hole' (samples 150 and 160) also proved to be interesting in terms of archaeobotanical remains. Sample 150 produced the largest flot from of all the samples (approximately 6 litres), with an abundance of charred grain, some of which appears to be germinated, and

detached coleoptiles (or 'sprouts') are also common. Charred cereal chaff, which is predominantly wheat with a trace of barley, and weeds seeds are also abundant. Both samples 150 and 160 are rich in anaerobically preserved plant remains, consisting of weed seeds and compressed vegetative material, much of which from sample 150 seems to contain animal hair and also reed leaves. The remaining samples contain small quantities of charred cereal grains and weed seeds as well as some cereal chaff, implying that low levels of domestic waste were being incorporated into the deposits.

Similarly to the samples from the Northern settlement, wheat appears with the greatest frequency in samples from the Southern settlement, followed by oats with only traces of barley. Wheat chaff also dominates the chaff component. The suites of weed species represented indicate a range of habitats including arable land, areas of disturbed ground and damp or wet habitats.

A number of samples (78, 84, 90, 144, 148 and 150) contain charcoal potentially suitable for identification and further analysis. Of particular interest may be the charcoal associated with pit [2335] and square ditch [2410] (samples 144 and 148) in terms of the selection of fuel for industrial activities. Analysis of the charcoal from the 'water hole' (sample 150) may provide information relating to the sources of fuel used for domestic purposes, which would be interesting to compare with that from features associated with the industrial activities.

### **Discussion**

At this stage of analysis there is very limited archaeobotanical evidence for either domestic or industrial/craft activities associated with the Iron Age area. There does appear to be domestic activity associated with the large enclosure ditch

(sample 3) in the Northern settlement. The boundary ditch (sample 157) has produced a range of domestic and industrial material, although the charred plant remains occur at relatively low density.

With the exception of sample 152, the saltern is sparse in terms of archaeobotanical remains. The sampled hearth(s) (samples 22, 28 and 51) provide meagre evidence for the type(s) of fuel used for salt production. It may be that material from raking out the hearths associated with the salt production could have been deposited into the large enclosure ditch [2247]. However, enclosure ditch [2247] is also adjacent to the Southern settlement and so the concentration of charred grain, chaff and weed seeds may be related more to the settlement activity rather than the saltern activity.

The assessment has demonstrated that the greatest concentrations of archaeobotanical remains and the focus for domestic activities appears to be associated with deposits from the Southern settlement, although there seems to be little in the way of domestic activity expressed in the archaeobotanical assemblages from the earliest dated features. Of particular note are the fills of the large water hole [?] which appears to have been filled in with domestic waste from a range of sources, and also enclosure ditch [1023], which provide evidence relating to crop processing activities and the economy associated with the Southern settlement.

In terms of the cereals, it appears that wheat occurs with the greatest frequency overall. The preliminary identifications suggest that species including possible spelt and emmer wheat were cultivated as well as a six-row hulled barley, which are typical crops for the periods represented on the site (Greig 1991). Oat also occurs in six samples, which is at a greater frequency than barley. It would be

necessary to investigate whether these apparent trends in frequencies are a reflection of preferences in crops, or the result of differential crop processing leading to barley being under represented and wheat over represented. Oat could also be over represented in relation to barley if it was simply a contaminant of the crop rather than deliberately cultivated, whereby the oat grains would be picked out and discarded as part of crop processing and cleaning. Alternatively, is it the case that the barley is under represented due to differential preservation, as remains of barley chaff are less likely to survive the charring process than that of wheat, which are more robust (Boardman and Jones, 1990).

The archaeobotanical evidence produced from this site should be examined in conjunction with other similar sites, for example Holland Park, Spalding – HPS99, Woolram Wygate, Spalding – SWW02 and Spalding Wygate Park – SWP04, in order to see if there are any detectable patterns in the economy and management strategies of these salterns and their associated settlements.

#### *Recommendations for the Archaeobotanical Remains*

- Further analysis of samples associated with the Iron Age area of activity in order to clarify the nature and extent of the activity.
- Full analysis of the samples associated with the Northern settlement to ascertain the nature and extent of the inferred domestic activities.
- Full analysis of the samples associated with the Southern settlement with regards to domestic and crop processing activities and in relation to the saltern activity.

- Determine the possible relationship between the Northern and Southern settlements if they are contemporary.
- Calculation of the densities of charred grain, chaff and weed seeds to determine the intensity of activity across the entire site and identify potential foci.
- Analysis of the composition of the weed seed assemblages where appropriate, in order to characterise the local environs and the crop field ecology.
- Analysis of cereal grain, chaff and weed seed assemblages to identify potential arable husbandry regimes.
- Compare the archaeobotanical data with that of similar sites in terms of continuity, trends and patterns with regards to the typical crops cultivated, arable husbandry regimes, the local environs and types of habitats exploited, as well as fuel and resources utilised for salt production.
- Charcoal analysis in relation to fuel selection for both industrial and domestic purposes, particularly the saltern and smithy.

#### **Auger Survey and palaeoenvironmental sampling**

Various hypotheses were developed on site as to how the saltern worked, or was supplied with salt water. A large creek running off to the north on the north side of the saltern was presumed to be the source, with a larger hollow or lagoon immediately north and north-east of the saltern site being a possible area in which the salt water was trapped. The

distribution of the sites and activities across the stripped area were also recognised as related to the pattern of sands and possible roddon features running across the site. In order to try and clarify the topographic distribution of the archaeology and the palaeoenvironmental history of the site and the archaeology an auger transect was laid out across the site from the south-west corner to the Iron Age settlement in the east. In addition a trench was cut across the creek and hollow on the north east side of the saltern (Appendix 10, Fig. 2) and this was drawn and sampled (Appendix 10, Fig. 3).

Sections were also sampled for foraminifera, pollen and radiocarbon dating in the saltpan trench - cut 2121 (Appendix 10, Fig. 4), pollen and radiocarbon in ditch section 2247 and the underlying deposits, foraminifera from the south-eastern edge of the so called lagoon, and pollen from the deep water hole in the southern area (Appendix 10, Fig. 5).

The auger transect was conducted using a hand auger with a 1m long 25mm diameter gouge auger. The location of each hole is indicated on Fig. 6 (Appendix 10). The results of the auger survey are presented in Figure 8 (Appendix 10). The deposits are mainly composed of sands, laminated sands and silts, and very fine silts, the deeper silts with some organic remains. Some of the deposits encountered are illustrated in Fig. 7 (Appendix 10). The broad sequence revealed in the boreholes indicates a series of basal wet laminated sands (Appendix 10, Fig. 7 -1) beneath boreholes 14-16 and the boreholes sunk beneath the creek trench at a depth of nearly four metres. These are indicative of an intertidal sand flat (Shennan 1994, zone 11) but their age are unknown. These deposits are covered with very fine and fine clay/silts with varying quantities of surviving organics (see Appendix 10, Fig. 7, 3 and 4). These sediments appear to be either saltmarsh or intercreek areas of silt

and clay accumulation (Shennan zones 7 and 9) reflecting a seaward movement of the coastline. At times the area may have been a fresh or brackish water lake. These fine silts and clay silts were subsequently cut during a period of higher sea level by two channels, one on the south west and one on the north east, both of which filled up with laminated sands (Fig. 7 - 2) forming roddons.

On the basis of the OSL data available from the Wygate Park Phase 9 project these roddons probably formed during the late Bronze and early Iron Age (Martin *et al* 2006), although whether they were contemporary we cannot say. Subsequently the raised roddon deposits formed within these channels became the preferred well drained locations for the Iron Age and Romano-British occupation on the site. These two roddons created an area of lower lying deposits between them. The saltern site is located on the north-eastern edge of the southern roddon with this area of lower sediments to the north and east. The saltern reflects a period of retreating sea during which the lower area between the roddons developed creeks that drained the saltmarsh, but an earlier, probably short, episode of retreating sea is suggested by the Iron Age occupation on the north eastern roddon, although this may not have been as permanent as the later Romano-British site in the south west of the site.

Continuing seaward movement of the coastline lead to the drying up of the creeks and the unsuitability of the area for salt production. As a result of this marine retreat the south eastern roddon became suitable for permanent occupation. The occupation is likely to have been relatively shortlived sine the lower area between the roddons began to fill with fine alluvial clay silts indicating a period of probably seasonal flooding and a peaty silt developed in the creek (BH12). This phase may have been sufficiently wet for an extensive marsh deposit to develop over

much of the landscape leading to the characteristic black silty clay horizon seen here and on other sites in the area. This deposit has been dated at Holland Park to the sixth-seventh century AD and suggests that at this time the area was unsuitable for occupation.

Finally the creek lying in the centre of the transect (BH12) began to fill with laminated sands indicating a return to an intertidal environment. Sea levels rose and finally deposited laminated inter-tidal sands across the whole site. The OSL dating of deposits in a similar stratigraphic position on Wygate Park Phase 9 suggest an 8-9<sup>th</sup> century date for the initial episode of sand deposition across the site, although it must have started earlier in the creeks.

Two illustrations are presented (Appendix 10, Figs. 9 and 10) to illustrate small and larger tidal saltmarsh creeks. The saltern should be envisaged as being located on the banks of a slightly smaller creek than the larger of these two.

## Conclusions

The Wygate Park Phases 9 and 10 projects have the potential for producing a detailed chronology for the land and seascape development of this area on the north-east side of Spalding which will have considerable value for the understanding of the whole area, and the archaeological management of it. It is clear that the Iron Age and Roman archaeology defines the limited period during which this area was available for exploitation since for much of the remainder of the last three thousand years the site lay in the intertidal zone and was either sand flats or saltmarsh. This chronology should closely reflect the periods when the area was available for salt production and when it could be colonised by farmers.

The waterlogged preservation in several of the deeper features and the series of pollen

samples should allow fairly detailed reconstructions of the vegetational history of the site, adding to the palaeoenvironmental picture of landscape change already established.

The initial results from the bulk samples clearly show that extensive agricultural activity was probably being undertaken at the Romano-British settlement and an apparent concentration on wheat, rather than barley, may indicate that the area was an important cereal producer. The distribution of this material may illustrate areas of crop processing activity. The waterlogged remains in several features associated with the settlements may yield further details of the site economy and local environment not usually available on site with no organic survival. The character of the settlement may also be reflected in the presence of a smithy. If the further processing of samples shows that the distribution of hammerscale and slags is concentrated around the small rectilinear ditch in the south west corner of the site, this might indicate a permanent smithy, which might imply a settlement of more status than a farmstead.

The excavations, samples and auger transect have shown that with detailed study the project should yield a landscape and palaeoenvironmental history of the site as well as a fairly detailed picture of the agricultural economy.

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26th April 2006

### 3. DISCUSSION

#### Introduction

The following section outlines the assessment results of Wygate Park, Spalding, Lincolnshire. The results are provisional with further analysis needed to fully understand and interpret the site.

Wygate Park is of regional and national significance, representing the largest excavation of any Roman saltmaking site and its environs in eastern England. Saltern deposits were remarkably well preserved with floor surfaces, post built structures and a stratified sequence of hearths and settling tanks recorded. The presence of associated structures within the saltern phase appears unique within the county.

Land use and settlement encompassing Late Iron Age to 4<sup>th</sup> C AD Roman deposits was recorded, presenting an opportunity to understand the interaction between these communities and the coastal fen landscape.

#### Landscape and Environment

Excavation revealed a landscape formed primarily in an active tidal environment, which operated from early prehistoric times through to the late Saxon period. Active creeks created a system of levees, slightly elevated ridges, or roddons, forming the topographic background (Section 2.11, Appendix 10).

A depression on the southern area of the

site developed into a 'salt pan' during seasonal marine flooding. Seawater became trapped within the depression forming a static pool of saline water and a refuge for marine fauna (Wilson 2005).

Archaeological deposits were restricted to the elevated areas of land, with creek systems apparently active in some form throughout the Roman period. Preservation of the site benefited from the period of marine inundation in the later Roman period, effectively sealing archaeology beneath up to a metre of silt.

The full extent of the site has not been completely revealed but certainly extends beyond the limits of excavation to the south and west. Early Roman saltmaking was revealed at Phase 9 SWPB04 located 33m north of Area A excavation (Hall forthcoming). Briquetage deposits of probable Roman date were also revealed on a recent evaluation of land at Pennygate, approximately 350m south east of Wygate Park (Trimble forthcoming).

An apparent late Iron Age droveway and settlement on the eastern part of the site was cut into a silted up creek levee, elevated above the salt marsh. This suggests the environment was suitable for at least seasonal pasture around the time of the Roman conquest. Late Iron Age deposits from the droveway appear to be chronologically contemporary with both the saltern and settlement of Phase 9 SWPB04 to the northwest. It is likely that the predominant creek system altered in the 1<sup>st</sup> to 2<sup>nd</sup> Centuries AD. The creek provided tidal flow enabling the production of salt and possibly forcing the abandonment of this ridge.

The saltern was located on the edge of a silted up roddon, with the ground surface dropping slightly to the north and west. The lower ground directly north of the saltern formed an expansive, shallow lagoon in the early Roman period. The

lagoon was fed by tidal water over flowing from the creek system, providing an ample supply of saline water. Salt production ceased in the 2<sup>nd</sup> Century AD, possibly due to a change in the creek system no longer providing adequate seawater.

From the 2-4<sup>th</sup> Centuries AD Wygate Park was suitable for arable and pastoral farming with a succession of enclosures and field systems being cut into the elevated areas of site. These field systems were abandoned in the later 4<sup>th</sup> Century when rising sea levels made the landscape untenable. Creek deposits overlying Roman archaeology exhibit laminated silts indicative of tidal or estuarine conditions.

#### Site Structure and Layout

Romano-British deposits formed distinct phases of land use outlined in Section 2.3. These deposits span approximately five centuries of occupation with the saltern phase producing a particularly dense and complex series of deposits. A preliminary site matrix has been constructed, with group numbers assigned to equivalent cuts and depositional sequences. Further sub phasing will be completed during full analysis of the stratigraphic, ceramic and environmental evidence.

The site is characterised by arable and pastoral field systems developed with respect to existing natural features. Ditch systems were cut from the late Iron Age through to the 4<sup>th</sup> century AD with a distinct change in land use in the 1<sup>st</sup>-early 2<sup>nd</sup> centuries AD during the saltern period (Phase 3).

A Late Iron Age droveway developed to the east of the development site appears to be the earliest anthropogenic use of the site. The droveway and associated holding pens suggests seasonal use of the landscape, possibly driving stock down onto the wetlands to graze in the spring and summer months. The possible pen

area located between two droveway ditches (Fig. 9) shows no evidence of hard standing and though cut into free draining silts, the area would quickly become unusable after prolonged animal trample. This might suggest the area being used on a temporary basis, possibly as a convenient place to clip the fleeces from sheep or separate livestock.

Modern farming requires the periodic sub division of livestock. Young male animals are separated from their mothers to maintain a breeding group of females. A small number of males are kept for stud whilst the majority are sold or slaughtered. It is likely Romano-British animal husbandry was similar and the droveway area was utilised for stock separation.

Two distinct areas were revealed on the saltern. The first area exhibited distinctive Roman saltmaking features within an enclosing ditch. East of the ditch was a sequence of structural features and possible floor surfaces (Fig. 10).

Rectangular settling tanks were located directly north and south of a hearth area (Fig. 10, Plate 6). The tanks were mostly clay lined to retain water and exhibited frequent recuts, possibly marking the seasonal production of salt. The hearths appeared to have been constructed from one dump of clay. Each phase of hearth was constructed within the clay and partially destroyed when the next hearth was constructed. Consequently the last fired hearth was the best preserved, with excavation having revealed the remains of at least two previous hearths. The elevated saltern area was partially surrounded by a deep curving ditch. This was a typical design in Roman salterns, noted in excavations at Helpringham and Cowbit in Lincolnshire (Lane 2005) and Middleton in Norfolk (Lane and Morris 2001, Fig 6).

The structural area to the east of the enclosing ditch appears to be unique in



Lincolnshire Roman salterns. A sequence of postholes, curving ditches and possible briquetage floor surfaces was present. The earliest postholes were cut into the laminated silts of the roddon. A complex sequence of briquetage deposits and cut features postdate this initial structure. Fine, compact layers of briquetage appear to have been dumped in and around the posthole structures, creating possible floor surfaces. Little domestic debris derived from within the posthole area, suggesting these structures were possibly storage areas or temporary shelters rather than genuine domiciles.

The expansion in field systems correlates to the end of salt production at Wygate Park during the 2<sup>nd</sup> century AD. The most likely explanation for salt production ceasing was a shift in the saltwater creek system no longer periodically flooding the shallow lagoon area. It is likely that salt production continued within the Spalding area on more productive sites after the abandonment of Wygate Park. The saltern located at SWPB04 phase 9 was archaeomagnetically dated to 130-240AD. This suggests a trend for saltmaking moving further north along the creek system, managed concurrently with the arable development of Wygate Park.

However it should be noted that the hearth sampled from SWPB04 was in poor condition and may have provided a slightly misleading date span (Karloukovski *Pers. Comm*). Three sherds of pottery were also recovered from the rake out of the sampled hearth, giving a provisional date of late Iron Age/ early Roman period (Hall forthcoming). It is conceivable that the two salterns were broadly contemporary utilising the same creek system around the 1<sup>st</sup> Century AD.

The formation of field systems and settlement structures during the 2<sup>nd</sup> century onwards indicates an expansion in the area of utilised land. As suggested above it is

likely the environment had gradually dried out in the 2<sup>nd</sup> century AD, with declining saltwater flooding the saltern area. A mixture of small arable plots and animal paddocks were created in addition to posthole and curving ditches built buildings. The stratigraphic data suggests a sizeable farmstead with constant occupation throughout the 2<sup>nd</sup>-4<sup>th</sup> centuries. The renewed marine transgressions in the 4<sup>th</sup> century AD possibly reduced the quality of the arable land forcing a geographical shift in the settlement to the elevated south and west areas beyond the development site.

### Chronology

The pottery assemblage from Wygate Park shows modest occupation of the site in the late Iron Age. The majority of the early ceramics were located on the eastern area of the site within the proposed driveway. However material has been recovered from the southern, northern and saltern areas, indicating that these areas were used in some form prior to the later extensive field system development.

A small assemblage of pottery was recovered from the saltern, suggesting an early Roman date with some crossover into the late Iron Age. This would corroborate the archaeomagnetic date for the last firing of the hearth at approximately 115AD (Appendix 11). The extensive settlement and field systems at Wygate Park appear to start in the 2<sup>nd</sup> century AD located on the slightly elevated ground at the north and south of the excavation area. The field systems continued to be used throughout the 3<sup>rd</sup> century, with the latest pottery present dating to the mid 4<sup>th</sup> century AD (Section 2.4. Appendix 4).

Decline in occupation of Wygate Park during the 4<sup>th</sup> century is possibly related to changing environmental conditions, with rising sea levels causing increased saline

conditions. Wygate Park's existing creek system appears to have been reenergized by salt-water inundations, eventually causing localised flooding. Silts overlying the Roman deposits at SWPB04 have been OSL dated to between the 7<sup>th</sup> and 10<sup>th</sup> century AD providing a sound chronological framework.

The settlement developed in the post saltern phase may have moved further west and south beyond the boundaries of the excavation area in the 4<sup>th</sup> century AD where it would be sealed under post Roman silting.

### **Trade and Industry**

Evidence for trade at Wygate Park was limited. Three coins were found from the Roman deposits and though two are fairly high value, the assemblage is too small for further comment (Section 2.5).

Modest quantities of imported ceramics were represented at Wygate Park, in the early Roman period. Samian vessels from Southern and Central Gaul were noted in addition to a single amphora sherd and Gallo-Belgic white wares (Appendix 4, Section 2.4). Like most other contemporary sites in the fenland, the bulk of the assemblage was derived from Nene Valley and locally produced wares. This suggests during the 2<sup>nd</sup> and 3<sup>rd</sup> centuries AD ceramic needs were being met from fairly local sources with a limited volume of high status or imported wares.

Industrial practices, however, are well documented in this assessment. Saltmaking (Phase 3) occurred throughout the 1<sup>st</sup> and 2<sup>nd</sup> centuries AD adjacent to an area of tidally flooded ground. The concentration of salt production formed a pronounced mound of briquetage suggesting several generations of salt producers utilising the site. Almost 190 kg of briquetage has been recovered from the Wygate Park saltern. However there is

little evidence for the salt being traded or used for salting meat. The lack of domestic debris around the saltern highlights its use as a purely industrial area. Salt may have been traded from the area, but the profits appear not to have been brought back to the saltern itself.

Metalworking has been identified on the southern settlement at two locations. The first was a possible smithy based in the rectangular ditched structure located in the southwest area of the site in Phase 2 (Fig. 11). The second metalworking zone was in an area of postholes, pits and a possible truncated furnace approximately 50m north of the possible smithy. The second metalworking area has provisionally been assigned to Phase 4, contemporary with the expansion in field systems.

A significant volume of smithing slag was identified in both these areas indicating on site iron smithing (Section 2.6, 2.7, Appendix 5 & Appendix 10). In addition several fragments of crucible were recovered and have been identified as potential copper smelting vessels. The paucity of ferric finds from the development site possibly suggests trading of any surplus items

Small scale bone and horn working has been revealed within the faunal assemblage, though this is a common component of subsistence economies (Section 2.7, Appendix 6).

Cereals are believed to have been grown during the settlement phases for domestic use. It is possible that surplus grain was traded in the local environs. In addition the straw produced from cereal cultivation would be a possible tradable commodity.

### **Site Status**

No definitive interpretative conclusions have been drawn as to the site status. The land use and status of the site changed

throughout the late Iron Age and Roman periods. Further analysis and integration of the site components are needed to provide a comprehensive interpretation of the site and its role within the Romano-British fenlands.

### Site Economy

Domestic animal bone was abundant in every period with the exception of Phase 3 the salt producing period. Cattle, sheep, horse and pig were documented indicating more varied animal husbandry than expected in a fen location of this period. There was a suggestion of breeding, particularly amongst the horse assemblage in the later settlement deposits *c.* later 3<sup>rd</sup> century. Non-domesticates make up a surprisingly limited percentage of the faunal assemblage suggesting exploitation of the surrounding fen was limited. Given the abundance of wildlife (eels, wild fowl and fish) in wetland environs, the limited exploitation may indicate a degree of social choice. However this apparent lack of fish and micro fauna may be attributed to a collection bias. Processing a higher percentage of the environmental samples is likely to produce a more balanced faunal assemblage.

Cereals and quern stones recovered from Phase 4 indicate cereal production and processing within the 2<sup>nd</sup>-4<sup>th</sup> centuries AD. The querns retrieved were of the rotary and beehive style, and mostly appear to have been made from Derbyshire gritstone. This suggests a self-sufficient subsistence economy growing and processing crops for domestic use (Section 2.11, 2.9). The ladder system developed in the 2<sup>nd</sup> century appears to have been used for spatially compact arable husbandry. Wheat and oats were grown in these plots

Environmental samples have produced evidence for sedge growing within Roman period. Sedge is a common wetland plant with a wide variety of uses including

roofing thatch. It is likely that native wetland plants were extensively used at Wygate Park and will be better represented after complete processing of the samples.

The quantities of iron slag and hammer scale retrieved from the southern settlement suggest a permanent smithy. The smithy was probably located in the rectangular ditched structure in the southwest corner of the site. This suggests for part of the settlement phase Wygate Park was self-sufficient in iron goods. It is likely that unsmithed iron blooms were imported to Wygate Park as there is no evidence for on site iron smelting.

## 4. CONCLUSIONS

Excavations at Wygate Park revealed field systems and settlement from the late Iron Age to the 4<sup>th</sup> century AD. A well-preserved early Roman saltern and its environs were investigated. In addition to saltmaking, Wygate Park revealed settlement deposits including iron smithing, copper working, cereal production and animal husbandry.

Saltmaking took place on the edge of an elevated area of land adjacent to a natural saline-pooled area. In addition to settling tanks and hearths, a sequence of structures was maintained next to the saltern for storage and shelter. All of these features show multiple phases of reuse during the 1<sup>st</sup> and early 2<sup>nd</sup> centuries AD.

Field systems and domestic enclosures were developed within the 2<sup>nd</sup> century suggesting a stable subsistence economy with mixed arable and pastoral farming and small scale metal working. The area was abandoned during or after the 4<sup>th</sup> century AD when changing environmental conditions made the landscape untenable.

The excavation suggests a flexible approach to land use at Wygate Park with

communities changing economy within an inconstant environment. Further analysis is recommended on the pottery dating, briquetage, metalworking, faunal remains and environmental data.

## 5. ACKNOWLEDGEMENTS

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#### 7. ABBREVIATIONS

APS Archaeological Project Services

GSGB Geological Survey of Great Britain

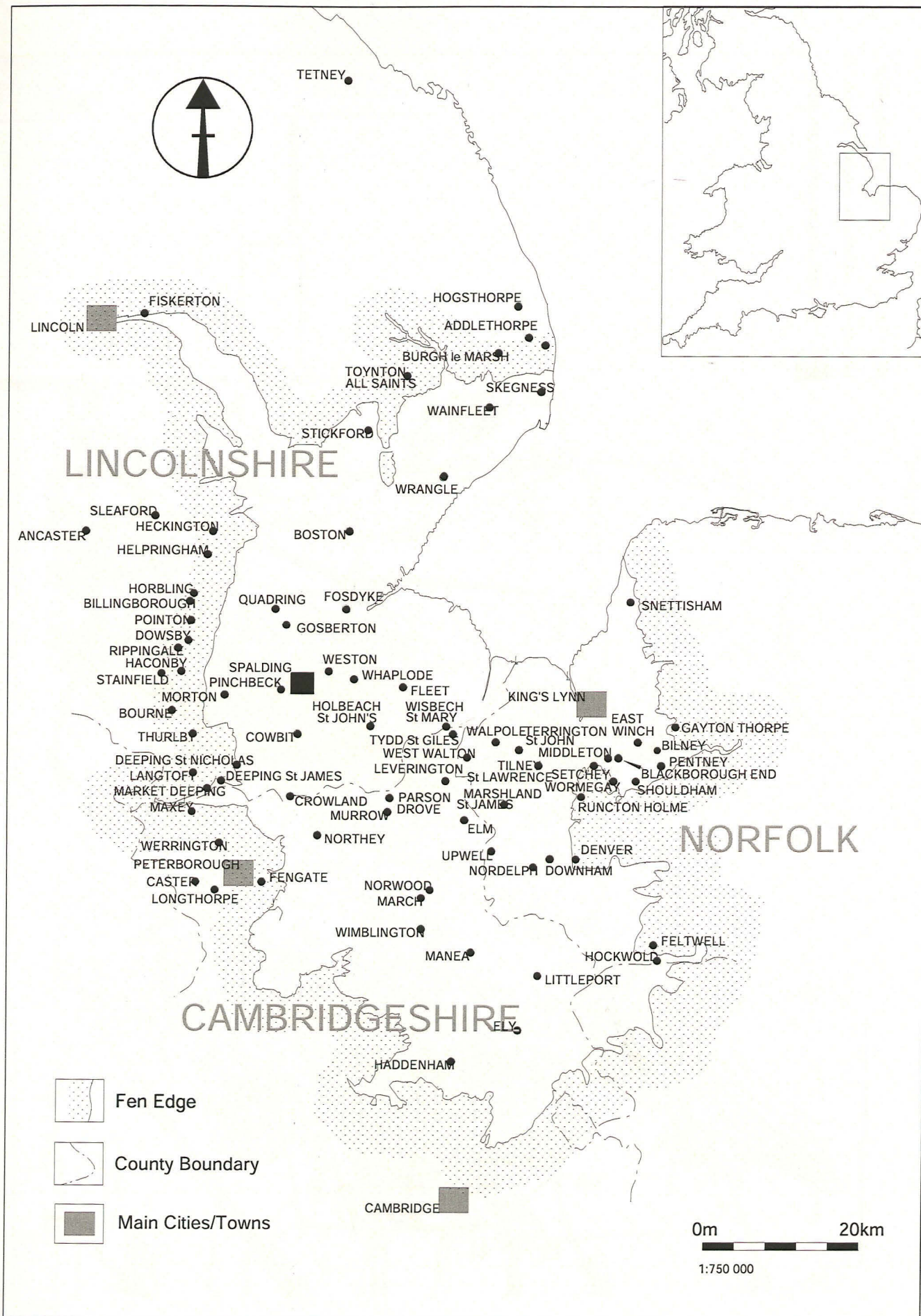


Figure 1 Location of Spalding within the Fenland and significant sites

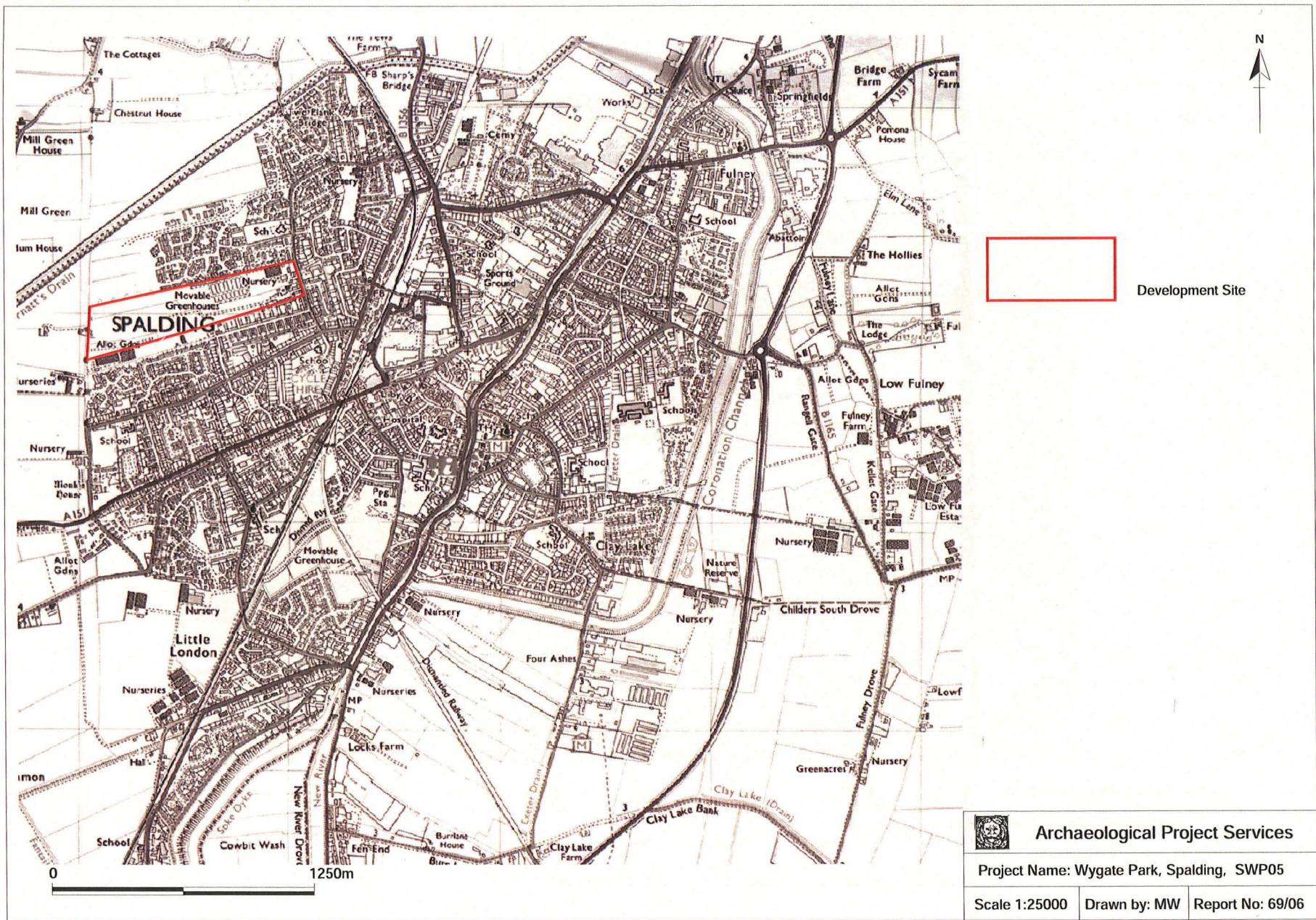


Figure 2 Development Site Location.

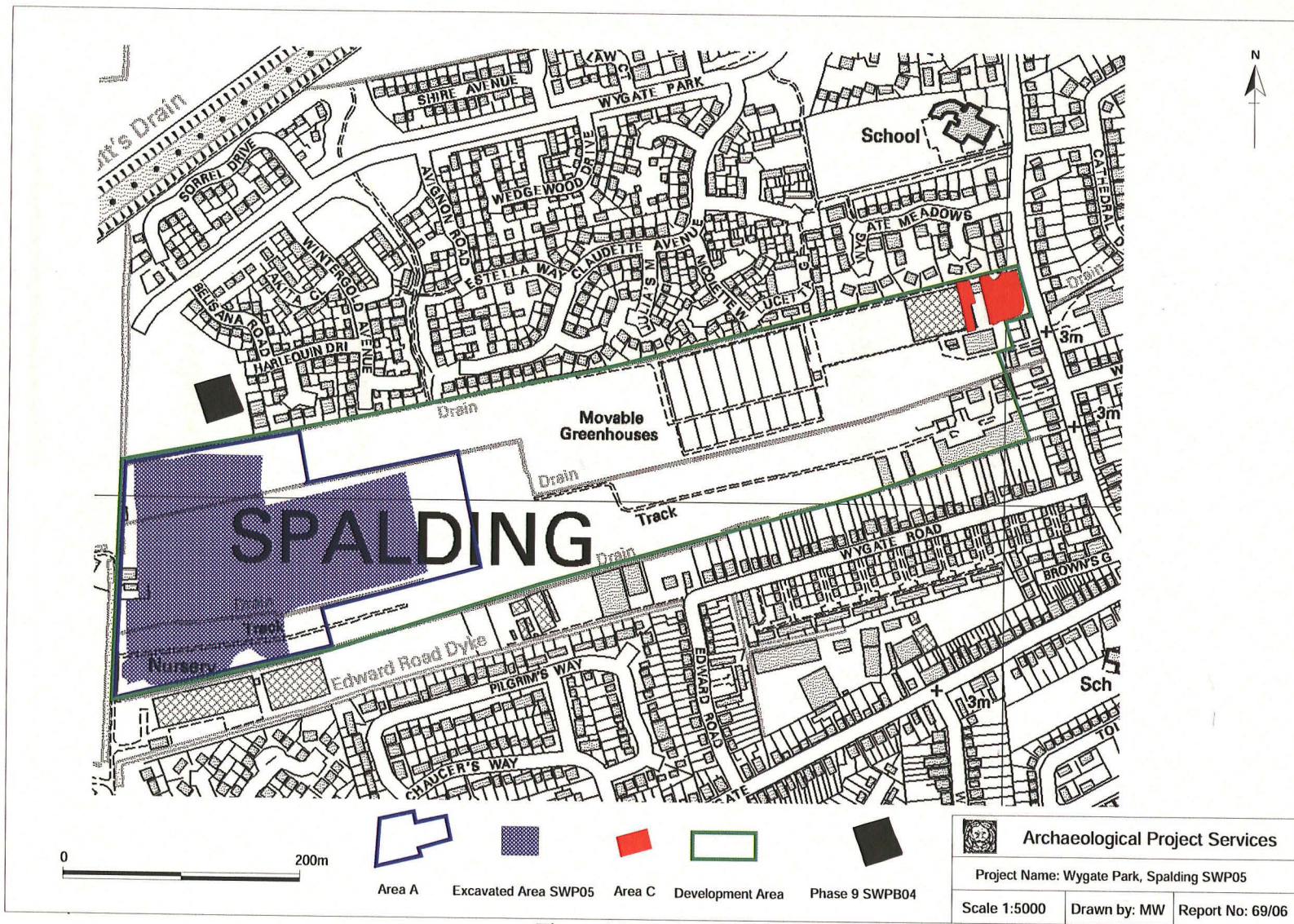


Figure 3 Location of Phase 9 and areas A and C.



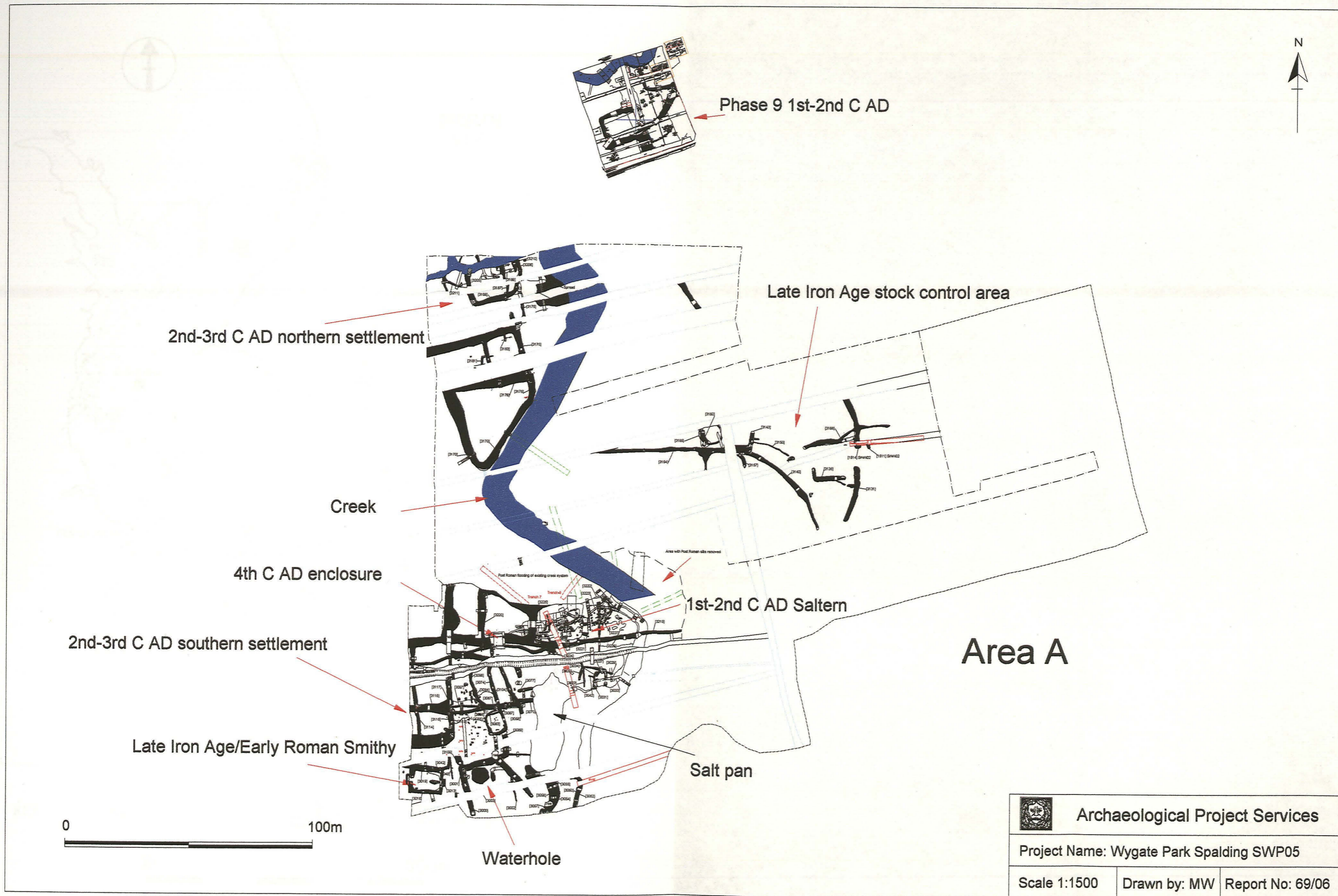


Figure 4 Excavation Area

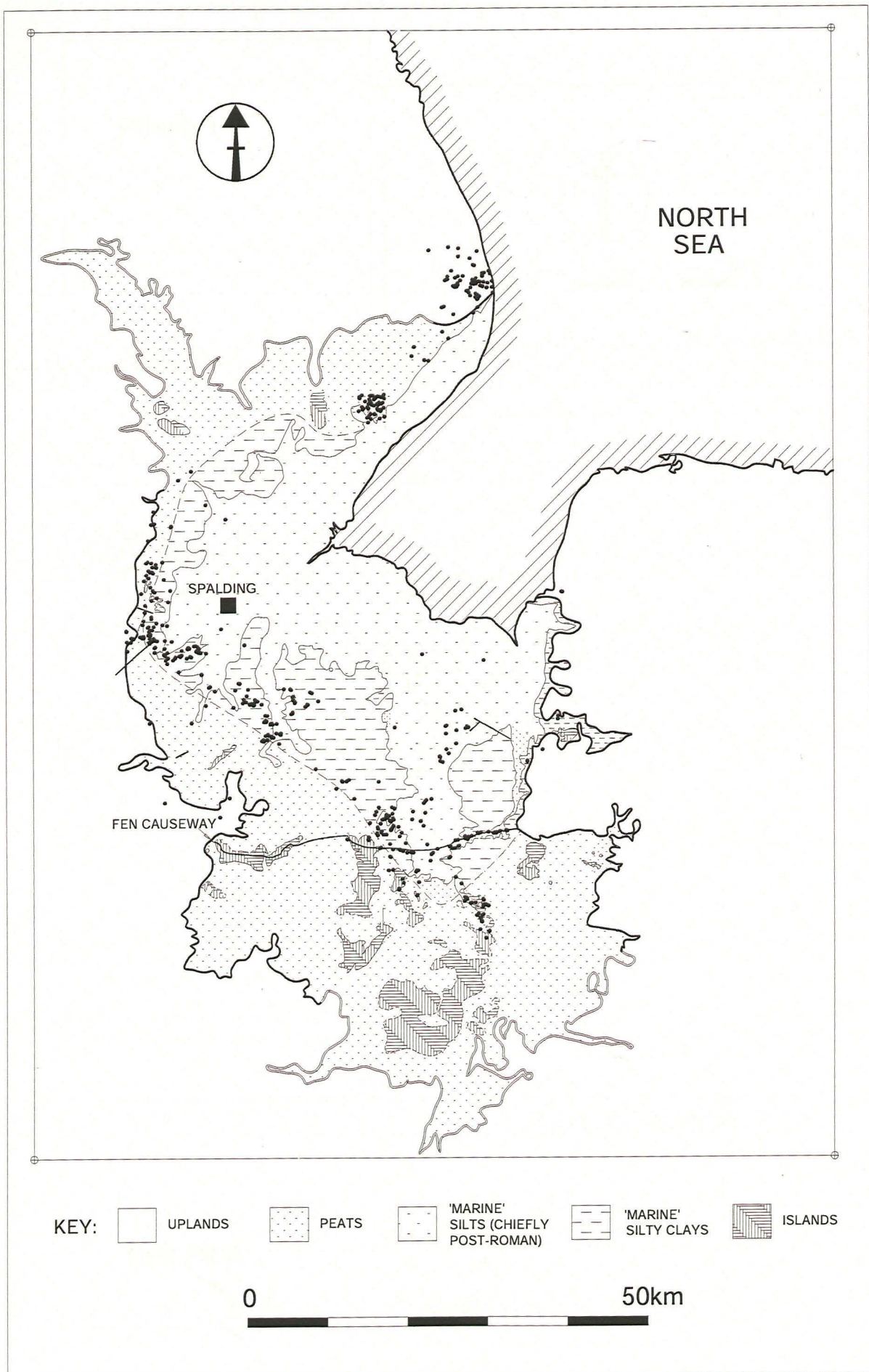


Figure 5 Location of Spalding and Iron Age or Roman Salterns in Fenland  
(From Lane and Morris 2001)

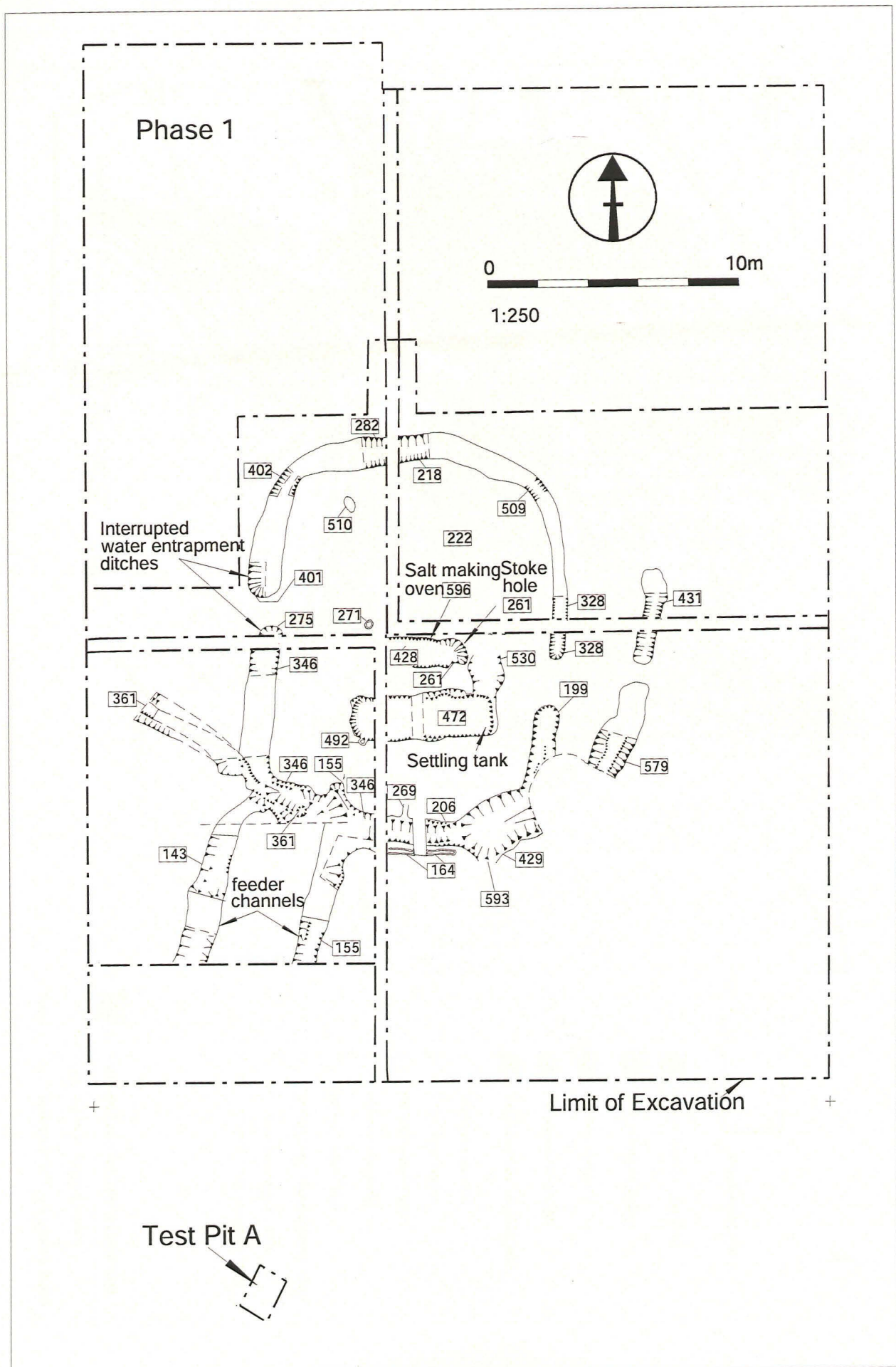


Figure 6 Plan of Middleton Saltern (From Lane & Morris 2001)

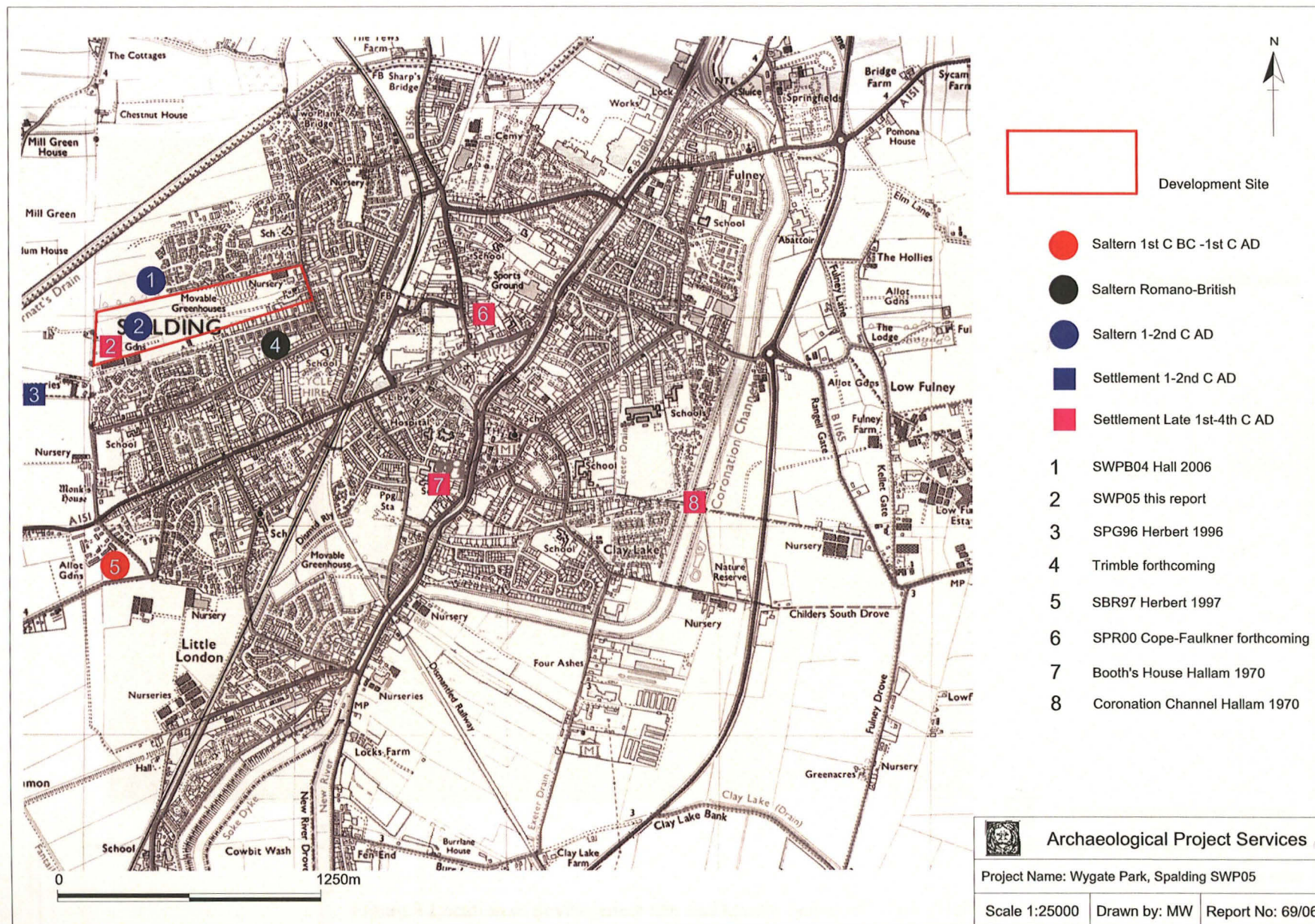


Figure 7 Location of Romano-British salterns and settlements within Spalding.

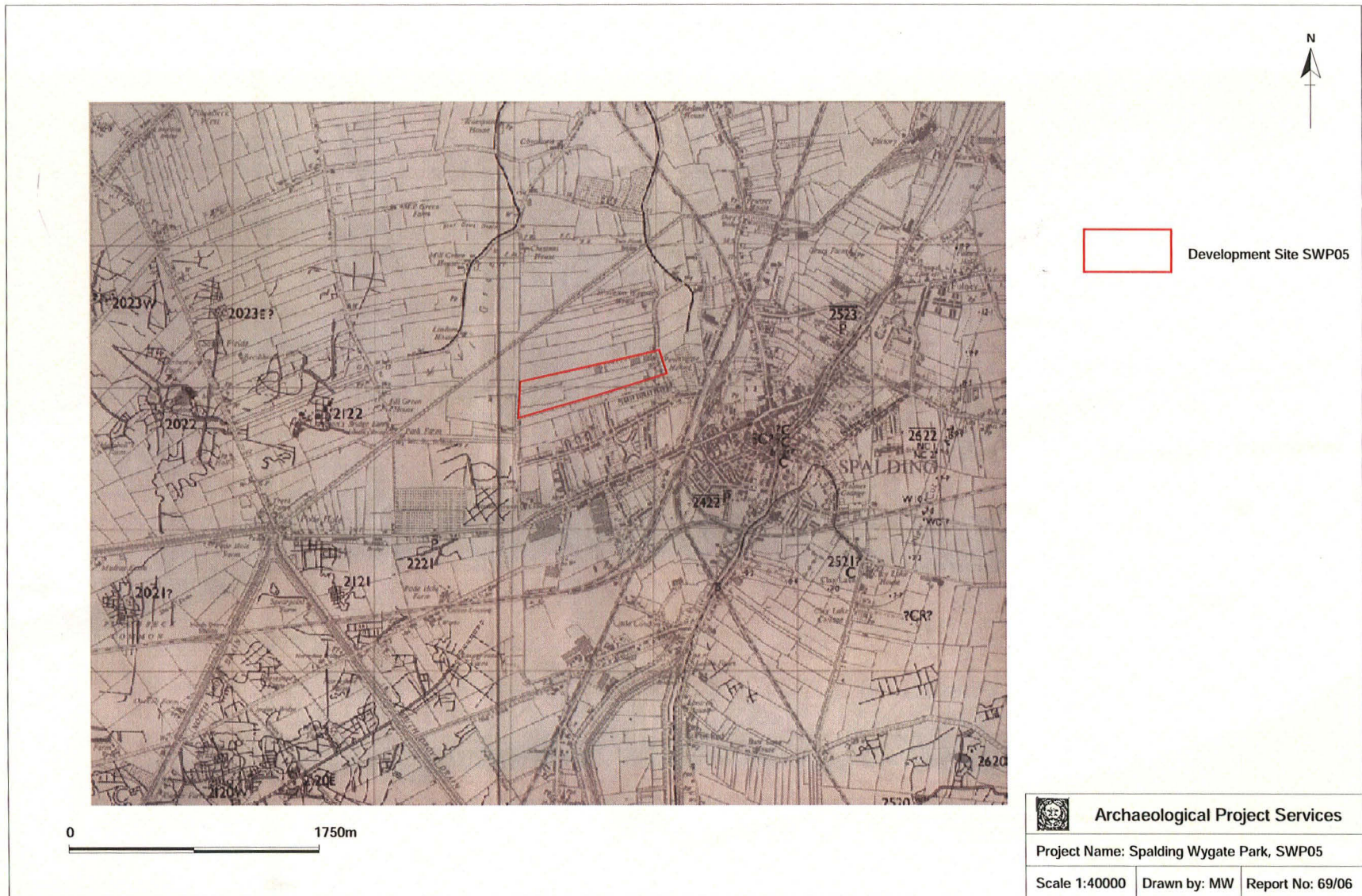


Figure 8 Location of development site and known cropmarks (from Hallam 1970).

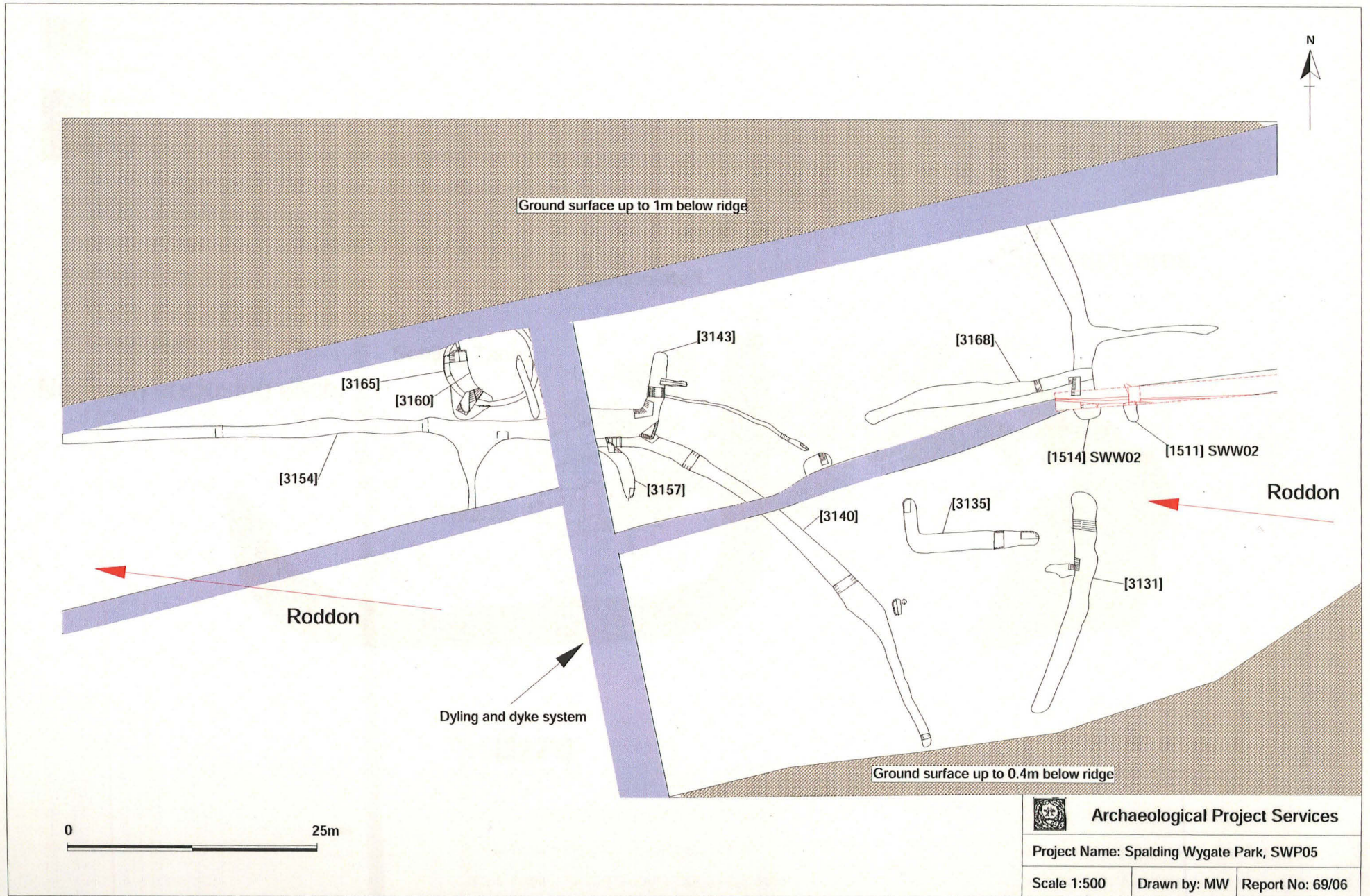
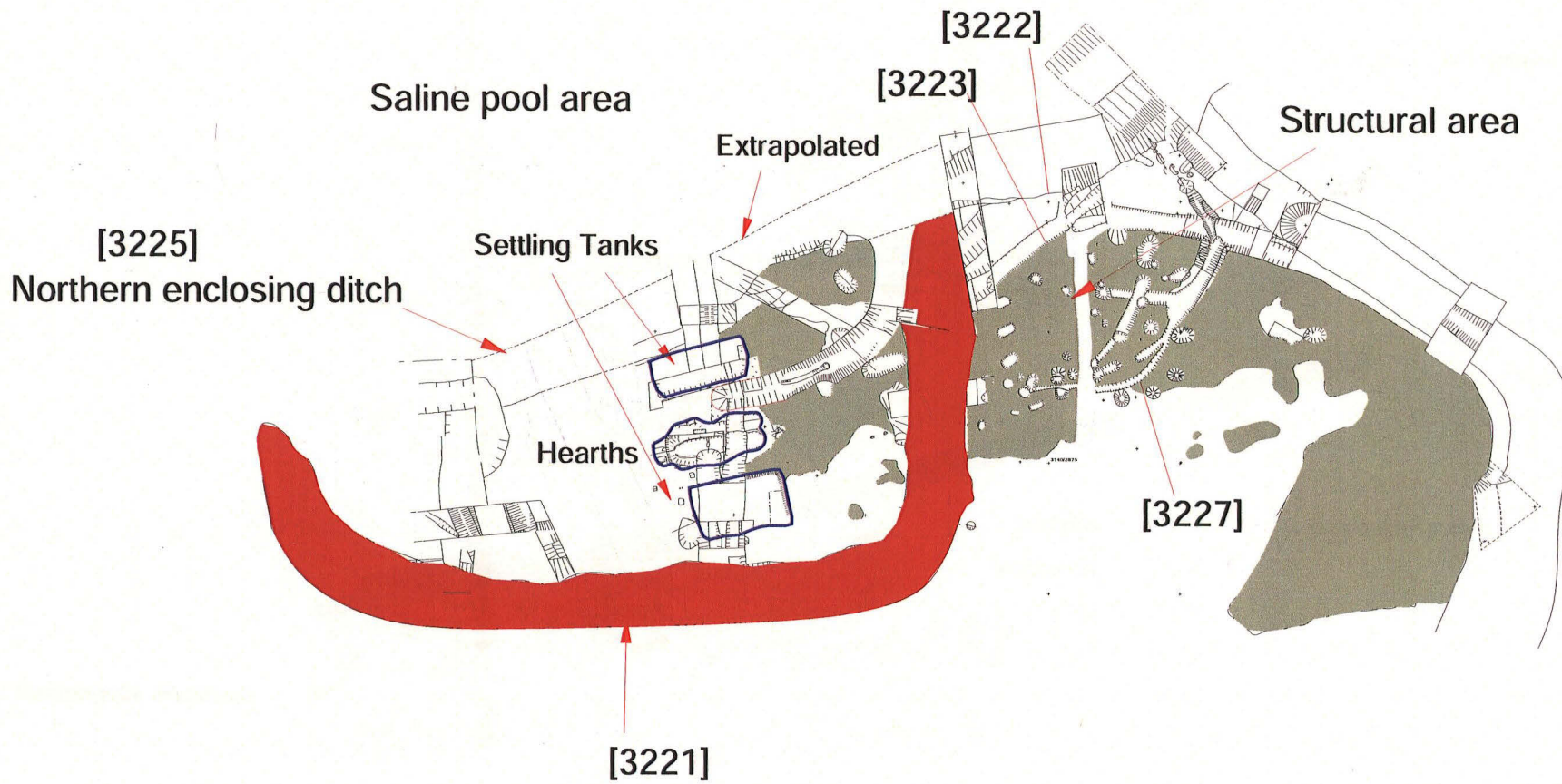


Figure 9 Iron Age Area

	Saltern Mound
	Post Saltern
	Hearths and Settling tanks
	Ditch [3221]



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Scale 1:250	Drawn by: MW	Report No: 69/06

Figure 10 Plan of the Saltern.

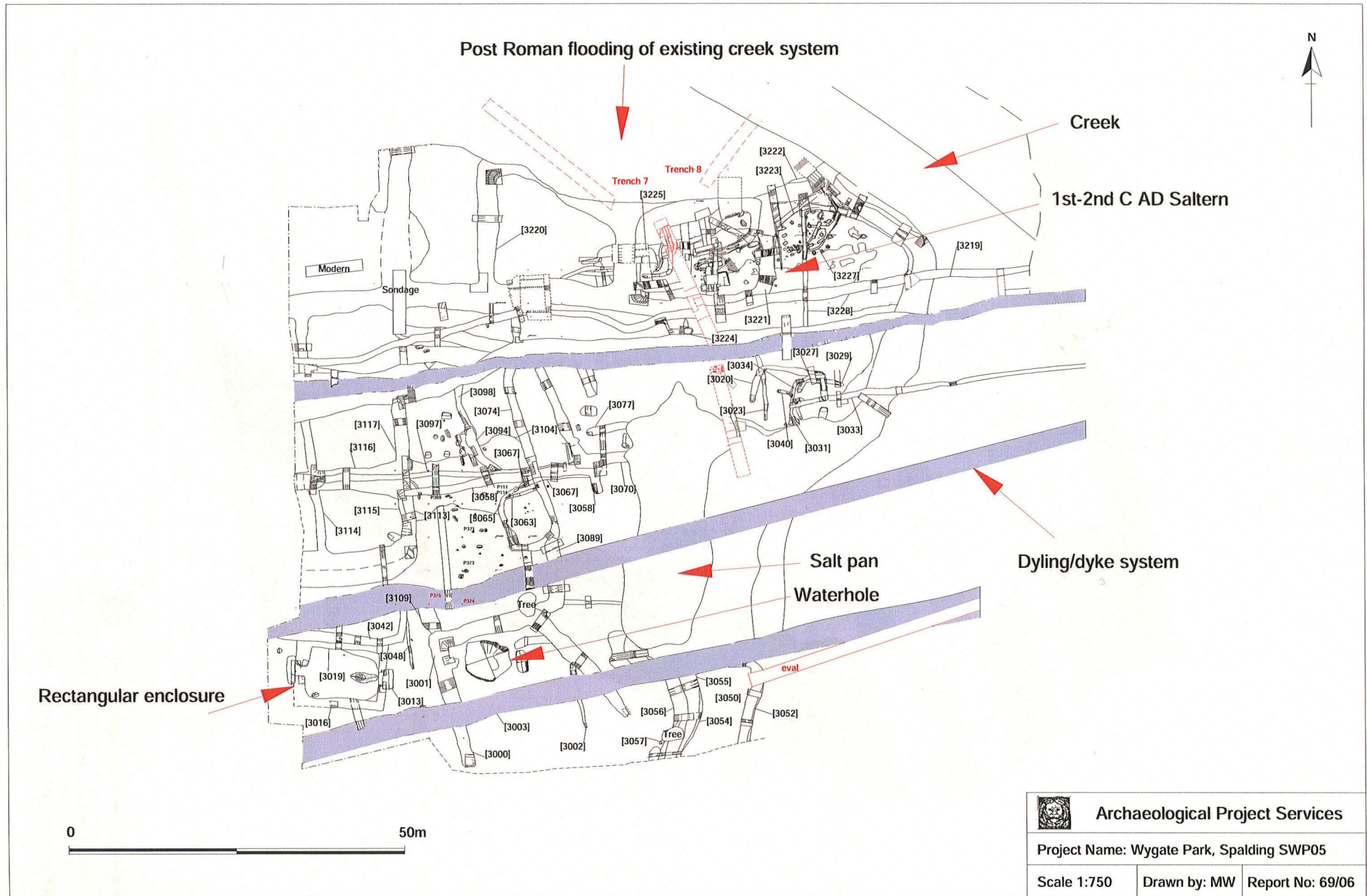
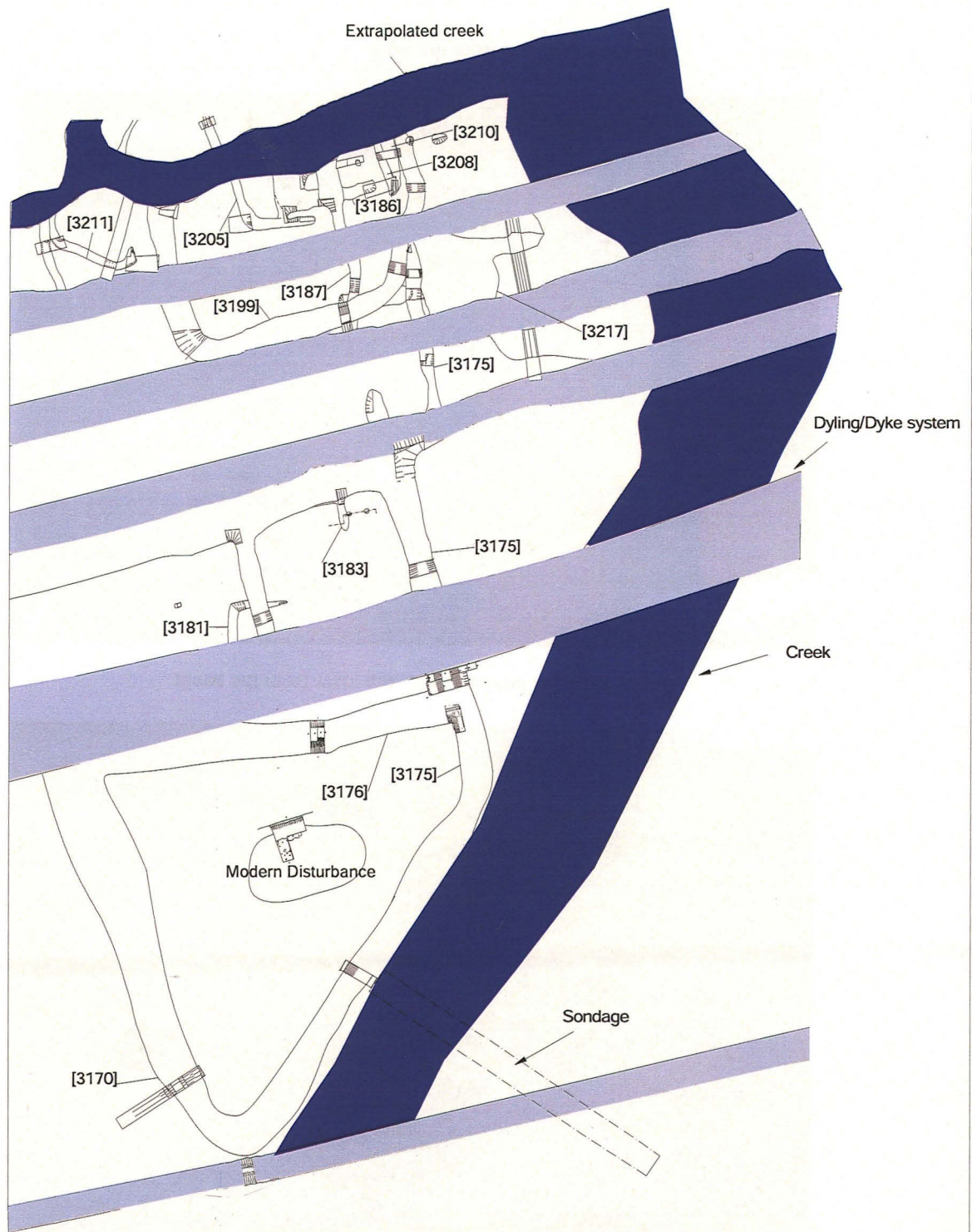


Figure 11 Plan of Southern Settlement.





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Scale 1:500

Drawn by: MW

Report No: 69/06

Figure 12 Northern Settlement



Plate 1 Aerial photo of Development site view from the south



Plate 2 The Saltern viewed from the west



Plate 3      The Waterhole viewed from the south



Plate 4      The Southern Settlement area viewed from the north



Plate 5 Recording the Saltern



Plate 6 The Saltern showing settling tanks and hearths