

ARCHAEOLOGICAL INVESTIGATION OF LAND OFF SUNNYDALE CLOSE, SURFLEET, LINCOLNSHIRE (SUSC22)

Work Undertaken For
Ashwood Homes

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1. SUMMARY

An archaeological strip, map and sample investigation was undertaken on land off Sunnydale Close, Surfleet, Lincolnshire in advance of residential development.

The works were undertaken as previous evaluation of the site identified possible salt-making dating to the medieval period.

The excavation revealed a probable saltern with periodical use. The recovered archaeological material suggests a 10th-12th century slat-production represented by possible small heaps of silt-waste mounds covered by raked-out hearth flooring, which progressed into the 13th-14th century by the build-up of a substantial silt-waste mound.

No features were revealed that could be directly related to salt-making, such as filtration units and hearths, though these may lie in close proximity of the site. The northern part of the site, lying closest to the River Glen, was notably lower and may indicate that any such remains may have been eroded by the former tidal range of the river.

Further features possibly associated with the salt-production include waste pits and a freshwater ditch.

The finds assemblage is largely domestic in nature with a significant amount of pottery. The earliest pottery dates to the Late Saxon and is evidenced by regionally produced Stamford wares. Much of the pottery can be dated to after the conquest, notably the 13th century with later pottery declining in amount during the latter part of the medieval period. Other finds include brick/tile, a spindle whorl. Industrial residues and post-medieval clay pipe.

2. INTRODUCTION

2.1 Definition of an Excavation

An archaeological excavation is defined as *'a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design'* (CIfA 2014).

2.2 Planning Background

A planning application (H17-1187-21) was submitted to South Holland District Council for a residential development on land east of Sunnydale Close, Surfleet. A program of mitigation, prior to development, was to be implemented focused on known medieval salt-making remains identified during a previous evaluation, towards the northern part of the site.

Archaeological Project Services (APS) was commissioned by Ashwood Homes to undertake the work, which was carried out between 8th February and 13th May 2022, in accordance with the Written Scheme of Investigation prepared by Archaeological Project Services and approved by the Archaeological Advisor to South Holland District Council.

2.3 Location, Topography and Geology

Surfleet is located 5.5km north of Spalding and 17.5km southwest of Boston in the South Holland district of Lincolnshire (Fig. 1).

The proposed development site lies south of Surfleet and the River Glen, at National Grid Reference TF 2520 2794 (Fig. 2).

Local soils are of the Romney Series, typically coarse silty gleyic brown calcareous alluvial soils (Robson 1990, 26).

The site covers approximately 1.7ha on generally level ground within the fenland of south Lincolnshire. Heights are in the region of 5m AOD.

2.4 Archaeological Setting

Surfleet is first mentioned in the Domesday Survey of *c.* 1086. Referred to as *Suerefelt*, the name is derived from the Old English *sūr* and *flēot* and means 'the sour inlet or creek (Cameron 1998, 120.

The Domesday Survey of *c.* 1086 records that the land was held by Heppo the Arblaster and contained extensive arable land and 2 salt-pans (Foster and Longley 1976, 65/1).

Lidar images show pockets of higher ground, towards the northern end of the site, broadly alongside the River Glen which would have been tidal during the medieval period. Such areas of higher ground within the South Lincolnshire Fens are comparable to the waste mounds associated with medieval salt-production sites.

A geophysical survey undertaken at the site identified a possible enclosure and a ditch. An area of magnetic anomalies was interpreted as possible being associated with salt-making activities and a dendritic pattern of anomalies suggest the presence of an infilled creek (Smith 2015).

A subsequent evaluation revealed a series of dumped deposits, typically associated with salt-making waste was revealed in the northern part of the site. Two pits and a former watercourse were also revealed during this investigation. Pottery recovered, along with burnt silt and fuel ash slag, suggests the site was active between the 11th and 14th centuries (Parker 2016).

An evaluation, immediately east of the current site, revealed a dump of burnt clay, probably associated with 14th -15th century salt-making towards the north of the Site. Several ditches, probably related to water management for the salt-making, were also revealed. A significant quantity of 11th-12th century pottery indicated that late Saxon and early Medieval activity was present on the site. Several sherds of later pottery, burnt clay, animal bones and slag were also recovered (APS 2021).

3. AIMS AND OBJECTIVES

The aim of the work was to remove the overburden of the site to archaeologically significant stratigraphy, methodically plan, excavate, and record the features present, gathering sufficient information to formulate a policy for the management of the archaeological resources present on the site.

The objectives were to:

- Determine the form and function of the archaeological features encountered;
- Determine the spatial arrangement of the archaeological features encountered;
- As far as practicable, recover dating evidence from the archaeological features, and
- Establish the sequence of the archaeological remains present on the site.
- Determine how the site can contribute to the East Midlands Research Agenda (Knight *et al.* 2012) and any updates to the

agenda.

- (early medieval) Can we elucidate the production and distribution of Early Medieval salt and glass,
- (high medieval) By what means were the extractive mineral industries controlled or organised by royal, monastic or lay lords?
- (high medieval) Can we identify, investigate and date sites associated with the region's key extractive industries?

4. METHODS

The removal of the overburden to the archaeological horizon, and the excavation of two, *c.* 50m long investigative trenches, carried out by a mechanical excavator equipped with a toothless ditching bucket, which were constantly monitored and supervised by Archaeological Project Services.

A sample of the features revealed were excavated in agreement with the Archaeological Advisor and a site plan was produced using a survey grade GPS (Fig. 3).

Sections of the features were drawn at a scale of 1:10 (1:20 in case of large and deep features) and plans at a scale of 1:20. Each deposit exposed during the investigation was allocated a unique reference number (context number) with an individual written description. A list of all contexts and their interpretations appears as Appendix 1. A photographic record was also compiled, and general site photographs were taken prior to and after the excavation of the proposed area (Plates 1, 26).

Environmental sampling was undertaken using guidelines established by English Heritage (2011). The subsequent processing of the samples is detailed in Appendix 3.

Artefacts collected during the fieldwork were bagged and labelled according to the individual deposit from which they were recovered, ready for later washing and analysis.

5. RESULTS

The results of the archaeological mitigation are discussed by features in stratigraphical order, approaching from the earliest to the latest depositions. Archaeological contexts are described below. The numbers in brackets are the context numbers assigned on the field.

The archaeological investigation revealed that the site lies on a substantial sized, medieval saltern mound. Most of the features truncated the silt deposits, therefore the natural geology was not recorded there.

Two *c.* 50m long and 1.6m wide investigative trenches (Trench A and Trench B) were opened into the suspected saltern mound, forming an "X" at the northern half of the site where the ground level was at its highest at 4.50m AOD.

The natural geology (003) was recorded as compact, rusty yellowish-brown sandy-clay between 2.85m AOD and 3.49m AOD, sloping unevenly towards West.

Trench A and Trench B (Fig. 4-5; Plates 2-5)

Two *c.* 50m long trenches aligned to northwest-southeast and northeast-southwest were opened by machine using a 1.8m wide toothless bucket, following the results of a hand excavated slot [053] which confirmed upon opening that further

intervention would be necessary for a more detailed understanding of the site. Natural geology (003) was found *c.* 0.54m deep from the ground surface at 3.40m AOD at the north-western end of Trench A. Sloping towards the centre of the trench and recorded *c.* 1.90m deep from ground surface at 2.80m AOD, the natural gradually rose to 1.15m deep from ground surface at 3.21m AOD, measured at the south-eastern end of the trench. In Trench B the natural geology (003) was recorded in the north-eastern end at *c.* 0.80m from the ground surface at 3.45m AOD, sloping to *c.* 1.90m from the ground surface at 2.80m AOD in the centre of the trench, then slightly rising to *c.* 1.31m deep from the ground surface at 2.94m AOD at the south-western end.

The earliest deposit (117-119-120-121) was hard, yellowish and orangey-brown sandy-silt backfill with occasional small fragments of clam and mollusc shells and occasional small flecks of charcoal. A small sherd of an amber glazed mid/late 13th to mid-14th century jug and five pieces of dark grey and mottled furnace slags were collected from the deposit (119). A rabbit bone was recovered from deposit (120) (Appendix 2).

The sandy-silt backfill (117-119-120-121) was cut by four pits [101], [115], [124], [126] and a northwest - southeast aligned ditch [108].

A 0.45m thick (*c.* 3.49m AOD at base), 2.70m wide and more than 2m long, oval shaped cut of a possible refuse pit [101] was recorded at the north-western end of Trench A. It had a sharp break of slope at its top, gentle northwest and slightly sharp southeast break at its base, moderately steep sides, and concave base. Its only fill (100) was hard, mottled greyish-brown sandy-silt with occasional small patches of burnt silt and small flecks of charcoal. No archaeological finds were found in this deposit.

Another refuse pit [115] was recorded in Trench A at its south-eastern end. It was possibly the eastern edge of a large waste pit [058], which was found to the east of the south-eastern end of Trench A (Fig. 10-11). The pit was 0.93m deep (3.36m AOD at base), 6.70m wide and more than 1.60m long. It had two fills; its earliest fill (114) was hard, greyish mid-brown sandy-silt with moderate mid-size patches of burnt silt, occasional mid-size mineralised silt blocks and small charcoal flecks. The later fill (113) was compact whitish-light grey mineralised sandy-silt with occasional small patches of burnt silt and small fragments of molluscs' shells. The pit had no finds within its fills.

The northwest – southeast aligned, 0.83m deep (*c.* 3.20m AOD at base), 3.50m wide and more than 2m long linear cut of ditch [108] was found at the north-eastern end of Trench B. It had sharp breaks of slope, steep northwest and gradual southeast sides, and concave base. The fill (107) was the earliest of the four fills found in the ditch. It was a hard, yellowish-light-brown sandy-silt with occasional small fleckss of charcoal. It was overlain by the hard, mid brown sandy-silt backfill (106) with the inclusion of moderate small flecks of charcoal. This was covered by a thin layer of friable mid to dark grey sandy-silt (105) with frequent charcoal, occasional small patches of burnt silt and small shell fragments. The ditch was capped by a hard, light mottled brown sandy-silt (104) with occasional small burnt silt patches and occasional small charcoal flecks. This was the only fill in the ditch with archaeological material, in the form of a single, thin glazed sherd of 11th-12th century pottery (Appendix 2).

The ditch [108] was truncated by a 0.35m deep (*c.* 3.63m AOD at base) and 1.55m diameter, circular cut of a refuse pit [103] with sharp breaks of slope, moderately steep sides, and flat base. Its only, friable,

dark greyish-brown sandy-silt backfill (102) had abundant mussel shells, occasional small blocks of burnt silt and frequent charcoal flecks. Fragments of cattle, pig and cattle-size animal bones were derived from the fill (Appendix 2).

A circular, 0.63m deep (*c.* 3.75m AOD at base) and 1.70m diameter possible waste pit [124] with sharp breaks of slope, steep sides and concave base was found in the north-eastern half of Trench B. The earliest of its two backfills was a compact, brownish-mid-grey sandy-clay (123) with occasional small fragments of clam or mollusc shells. Its upper fill (122) was hard, mottled light-brown sandy-silt with occasional small flecks of charcoal. No finds were found in the pit.

Another, 0.38m deep (*c.* 3.86m AOD at base) and 0.65m diameter, circular cut of a waste pit [126] was found at the north-eastern end of Trench B with sharp breaks of slope, steep northeast and nearly vertical southwest sides and concave base. Its backfill (125) was hard, yellowish-light-brown sandy-silt with occasional small clay patches and medium size charcoal flecks. It did not contain archaeological finds.

The sandy-silt fill (117-119-120-121) was overlaid by a further hard greyish-brown sandy-silt fill (116 and 118) with moderate small fragments of mollusc shells and small charcoal flecks. It measured 0.68m deep (2.74m at base), more than 10m wide and more than 1.60m long. This layer contained numerous complete and fragmented animal bones of various species such as rabbit, dog, cat, horse and cattle. Some fragmented oyster shells were also collected from here. Sherds of 13th-14th century pottery from six vessels, a small piece of ceramic building material and a piece of dark grey furnace slag were recovered from deposit (116), while two sherds of early medieval to 13th-14th century pottery were derived from deposit (118) (Appendix 2). The deposit appeared to be forming a large oval shape with northwest – southeast alignment and concave base, located at the top of the mound covering most of the area occupied by Trench A and Trench B.

The fills (116) and (118) (previously (055) and (056)) had been cut by a greater than 1.70m deep (*c.* 2.11m AOD at base continuing on), 6.65m wide and more than 1.00m long, possibly circular, or perhaps, oval shape cut of a substantial refuse pit/well [112], with gentle break of slope at its top, gradual northwest and steep southeast sides. The feature carried on deeper and could not be followed further for safety reasons. The pit/well had two visible fills, an earlier hard, dark brownish-grey sandy-silt backfill (111) with frequent charcoal and occasional small fragments of mollusc shells. The fill contained several broken pieces of red brick of late medieval to early post-medieval date, many complete and fragmented animal bones of large size species such as horse, cattle, sheep/goat, cattle-size animal and dog or fox. Several sherds of Saxo-Norman to 13th-14th century pottery and a small, pale blue bead were also recovered from the deposit (Appendix 2). This fill was covered by a hard, mid greyish-brown sandy-silt backfill (110) with occasional small fragments of clam shells, mollusc shells and charcoal flecks. Only a small sherd of medieval jar or bowl from the mid/late 13th to mid-14th century was found here (Appendix 2).

The pit/well [112] was sealed by a 1.37m thick (*c.* 3.12m AOD at base), more than 4.00m wide and long, hard, yellowish mid-brown sandy-silt backfill (109) (previously 054) with occasional small charcoal flecks, small fragments of clam shells, small patches of burnt silt and mollusc shells. The recovered finds consisted of a heavily encrusted nail, a Rhenish lava stone, a chopped and chewed pig bone, a fragmented horse bone, four medieval

pottery sherds of late 13th and early/mid-14th centuries and a brick fragment of late medieval or early post-medieval date and a yellowy/light grey fuel ash slag (Appendix 2).

Features on the eastern edge of the site
(Fig. 6-7, 8-9, 10-11; Plate 6-10)

A *c.* 10m long and *c.* 1.40m wide trench [057] has been cut into a large, irregular shaped pit-like feature at the north-eastern edge of the site (Fig. 6-7). The full extent of this could not be determined accurately as it appeared to be a series of backfills on the east slope of the waste silt layers of a saltern mound. Altogether 17 layers of waste soil were identified here. The natural geology (003) was found at *c.* 0.92m deep from ground surface (*c.* 3.34m AOD) at the northern end of the trench, *c.* 0.99m deep from ground surface (*c.* 3.20m AOD) at the centre, and *c.* 0.92m deep from ground surface (*c.* 3.35m AOD) at the southern end.

The earliest deposit (041) was a 0.17m thick (*c.* 3.20m AOD at its deepest point), 2.68m wide and more than 1.50m long, compact, light-brown sandy-silt fill with occasional small flecks of charcoal and burnt silt. It contained various sherds of Saxo-Norman to medieval pottery such as small to large size jars, pitchers and bowls (Appendix 2). It was covered by a 0.43m thick (*c.* 3.30m AOD at base) firm, mid-brown silt deposit (039) which contained burnt silt patches, medieval pottery sherds of Saxo-Norman to 14th century vessels and sheep size animal bone fragments (Appendix 2). A 0.22m thick (*c.* 3.30m AOD at base), 2.72m wide and more than 1.00m long, firm, light-brown sandy-silt backfill (038) was covering the deposit of (039) with occasional small flecks of charcoal and small blocks of burnt silt. It had moderate northern slope from ground surface. It contained a sherd of medieval pottery of 11th to 12th centuries. Backfill (040) was covering the northerly end of deposit (039). It was 0.11m thick (*c.* 3.30m AOD at base), 2.58m wide and more than 1.5m long. This firm, mixed mid-orange to blue sandy-clay had no inclusions and did not contain archaeological finds. It was overlaid by a series of northerly sloping, probably contemporary deposits (037), (036) and (035). The earliest of them was (037), a 0.16m thick (*c.* 3.42m AOD at its deepest point), 2.53m wide and more than 1.00m long, mineralised, light-grey sandy-silt fill with occasional small flecks of charcoal. Medieval pottery sherds of 11th and 12th centuries and bone fragments of a sheep size animal were collected from the deposit (Appendix 2). This fill was covered by a 0.17m thick (*c.* 3.42m AOD at its deepest point), 1.79m wide and more than 1.00m long, firm, brownish-red, burnt sandy-silt backfill (036). No finds were found in this context. It was overlaid by a 0.27m thick (*c.* 3.42m AOD at its deepest point), 2.44m wide and more than 1.00m long, organic, firm, mid-brown sandy-silt backfill (035) with occasional small flecks of charcoal. There were no finds found in this fill. It was covered by one of the most prominent deposits in the trench, a horizontally laid 0.58m thick (*c.* 3.42m AOD at base), 6.34m wide and more than 1.00m long, firm, light brown sandy-silt backfill (031) with occasional small flecks of charcoal and small burnt silt blocks. Three sherds of medieval pottery from the 11th to 12th centuries were recovered from the context (Appendix 2). It was probably contemporary with a northern sloping fill (026), which covered its southern end. It was a 0.26m thick (*c.* 3.64m AOD at its deepest point), 2.28m wide and more than 1.5m long, firm, mid-yellowish-brown sandy-silt with occasional small flecks of charcoal and small burnt silt blocks. Although it had a large extent, no finds were recovered. This fill was covered by a similar deposit (042) at its southern end. The margin between the two fills was not well-defined. The horizontally laid 0.28m thick (*c.* 3.70m AOD at base), 0.94m wide and more than 0.50m long, firm, light brown sandy-silt layer had occasional

small flecks of charcoal and burnt silt blocks. There were no archaeological finds. This was covered by a horizontally laid, 0.17m thick (*c.* 3.95m AOD at base), 1.39m wide and more than 0.50m long, firm, brownish-red sandy-silt backfill (034) with occasional small burnt silt blocks. There were no finds recovered from this fill. It was laid over by a widespread, 0.26m thick (*c.* 3.75m AOD at its deepest point), 4.88m wide and more than 1.00m long, firm, mid-grey organic, mineralised silt deposit (033) with occasional small inclusions of burnt silt blocks. No archaeological finds were found here. It was probably contemporary with at least two other fills, (032) and (030). The smaller of the two was a 0.07m thick (*c.* 4.10m AOD at base), 0.77m wide and more than 0.50m long, firm, light brown sandy-silt lens (032). It was found within the context of (033) and contained occasional small, burnt silt blocks. No finds were present in this fill. The other, potentially contemporary fill lying over (033) was the widespread, 0.32m thick (*c.* 3.80m AOD at its deepest point), 2.98m wide and more than 1.00m long, firm, light brown sandy-silt fill (030) with occasional small flecks of charcoal and small burnt silt blocks. It had a slight, gradual slope to North. No finds were recovered from here. It was covered by a 0.05m thick (*c.* 4.05m AOD), 1.44m wide and more than 1.00m long, north sloping, firm, mid-grey ashy-silt deposit (029) with occasional burnt silt inclusions. It was overlain by a similarly thin, 0.06m thick (c. 3.95m AOD at its deepest point), 2.04m wide and more than 1.00m long, gradually north sloping, firm, brown silt layer (028) with occasional, small charcoal flecks. The uppermost layer (027) in the stratigraphy of the trench was a 0.11m thick (*c.* 4.10m AOD at its deepest point), 0.87m wide and more than 1.00m long, firm, greyish-brown sandy-silt with occasional small flecks of charcoal and small, burnt silt blocks. Fragments of sheep and pig bones were collected from here (Appendix 2).

Three pits [006], [008] and [092] were found intercutting each other south of the investigative trench [057] (Fig. 8-9). The earliest of them was [092], an oval shaped pit with gentle breaks of slope, gentle sloping sides and concave base. It was 0.20m deep (*c.* 3.92m AOD at its deepest point), 0.90m wide and more than 0.73m long. It was aligned to east - west. Truncated by the other two pits [008] and [006], its single fill (091) was soft, mid brown sandy-silt with occasional burnt silt, small angular stones and small flecks of charcoal. No finds were recovered. It was cut by a circular pit [006] at its eastern edge, with gradually sloping sides, gradual breaks of slope, and uneven base. It measured 0.07m deep (*c.* 4.24m AOD at its deepest point), 0.90m wide and 1.13m long. It had a firm, mid brownish grey sandy-silt backfill (005) with occasional burnt, small silt and small charcoal flecks. The central pit [092] was also truncated by a large, circular pit [008] at its western edge, with moderately sloping sides, concave base, sharp break of slope at the top and gentle break at the base. It was 0.44m deep (*c.* 3.92m AOD at its deepest point) and had a 2.32m diameter. It was filled by soft, greyish-brown sandy-silt (007) with moderate, medium size, burnt, hardened silt blocks and occasional small flecks of charcoal. A small fragment of bone of a sheep sized animal was found here (Appendix 2).

An elongated, east - west aligned, irregular shaped, pit-like feature was found east from the south-eastern end of Trench A, at the eastern side of the site. It was c. 14.50m long and on average 2.50m wide. The feature did not have a well-defined outline. A 9.5m trench [058] was opened to investigate the feature (Fig. 10-11). Altogether, twenty-seven deposits and a pit were recorded here. The base of the trench was generally flat, the natural geology (003) was found 0.94m deep from ground surface (3.26m AOD) at the eastern end of

the trench, 0.99m deep (3.20m AOD) in the centre and 1.12m deep (3.17m AOD) at the western end.

The earliest deposit (071) in the trench [058] was 0.26m thick (*c.* 3.07m AOD at base), more than 0.85m wide and 4.35m long, horizontally laid, firm, light brown sandy-silt backfill with occasional small charcoal flecks. There were no finds in the fill. It was covered by a 0.33m thick (*c.* 3.20m AOD at base), more than 0.93m wide and 7.05m long, firm, light-brown sandy silt backfill (069) with occasional burnt silt. It contained sheep and other unidentifiable animal bone fragments and three sherds of 12th to 13th century pottery (Appendix 2).

A thin, contemporary layer, 0.07m thick (*c.* 3.26m AOD at its deepest point), more than 0.96m wide and 1.35m long backfill (070) into deposit (069), sloping gradually from the west. It was firm, mid-greyish-brown sandy-silt with occasional burnt silt inclusions. No finds were found in this fill. It was overlain by a gently east sloping, 0.11m thick (*c.* 3.67m AOD at its deepest point), more than 1.25m wide and 1.52m long, compact, mid-brownish-grey mineralised organic silt (068) with occasional small blocks of burnt silt/clay. There were no archaeological finds in this deposit which was partially covered at its western end by a gently west sloping, 0.12m thick (*c.* 3.67m AOD at its deepest point), more than 1.18m wide and 0.36m long, firm, mid-brownish-red, burnt silt (067) with occasional small charcoal flecks and no finds. This was sealed by a gently east sloping, 0.10m thick (*c.* 3.72m AOD at its deepest point), more than 1.07m wide and 1.24m long, firm, dark brownish grey sandy silt deliberate backfill (066) with frequent small charcoal flecks and moderate small burnt silt/clay chunks. This waste deposit had no finds and was covered by a moderately west sloping, 0.13m thick (*c.* 3.67m AOD at its deepest point), more than 1.21m wide and 1.49m long, firm, light-brown sandy-silt (065) with occasional burnt silt inclusions and no finds. It was overlain by an east sloping, widespread, 0.15m thick (*c.* 3.26m AOD, more than 1.12m wide and 5.25m long compact, mid-brownish-grey mineralised organic silt (064) with occasional burnt clay inclusion.

Two deposits covered (064), (063) in the western end of the trench and (082) at the centre. The deposit (063) was a westerly sloping, 0.07m thick (*c.* 3.90m AOD at its deepest point), more than 1.00m wide and 0.49m long, firm, brownish-red silt/burnt silt without any artefacts. Sloping gradually to the east was a 0.13m thick (*c.* 3.35m AOD at its deepest point), 0.66m wide and 3.01m long, firm, light-brown sandy-silt with occasional burnt silt (082). Three cattle bone fragments and 12th century pottery sherds were found here (Appendix 2). It was sealed by a gently east sloping layer of a 0.05m thick (*c.* 3.42m AOD at its deepest point), 0.77m wide and 0.91m long, firm, mid-brownish-red, burnt sandy-silt (079). There were no finds in this deposit which was overlain by a similarly thin deposit (078) which was 0.11m thick (*c.* 3.42m AOD at its deepest point), more than 0.81m wide and 2.00m long. It was firm, light-brown sandy-silt with occasional burnt silt/clay. It had no archaeological finds. Both layers (063) and (078) were under a gradually east sloping, 0.13m thick (*c.* 3.42m AOD at its deepest point), more than 1.28m wide and 4.35m long, compact, mid-grey, mineralised organic waste silt (062) with occasional small blocks of burnt silt/clay. This fill was recorded without archaeological finds. It was overlaid by a gently east sloping backfill (077). It was 0.31m thick (*c.* 3.26m AOD at its deepest point), more than 0.98m wide and 7.50m long, firm, light-brown sandy-silt with occasional burnt silt/clay. A partial skeleton of a rabbit and a single piece of chicken bone were collected from here with four sherds of mixed Saxo-Norman and 13th to 14th

century pottery (Appendix 2).

The deposit (077) was covered by an easterly sloping layer (061). It was a 0.16m thick (*c.* 3.38m AOD at its deepest point), more than 1.24m wide and 3.57m long, compact, mid-grey mineralised organic rich silt backfill with occasional small blocks of burnt silt/clay and no finds. It was covered by two, east sloping backfills, (060) in the western end of the trench and (076) in the centre. The 0.16m thick (*c.* 4.00m AOD at its deepest point), more than 1.33m wide and 1.77m long, firm, mid-greyish-brown sandy-silt (060) had occasional small blocks of burnt silt, but no finds. The much thinner, 30mm thick (*c.* 3.45m AOD at its deepest point), more than 0.83m wide and 1.10m long, firm, mid-greyish-brown sandy-silt backfill (076) had occasional burnt silt. No finds were found in this context. This fill was sealed by a gently east sloping, 0.19m thick (*c.* 3.41m AOD at its deepest point), more than 1.03m wide and 5.75m long, firm, mid-brownish-grey sandy-silt (075) with occasional burnt silt/clay and moderate small charcoal flecks. Sherds of Saxo-Norman and early medieval pottery were recovered from the deposit along with fish, bones of sheep-size animal and a single bone of a red deer (Appendix 2).

The sandy-silt deposit (060) was covered by gently east sloping, 0.27m thick (*c.* 4.01m AOD at its deepest point), greater than 1.37m wide and 2.10m long, firm, light-greyish-brown sandy-silt (059) with occasional small blocks of burnt silt. This was covered by two, probably contemporary deposits, (085) and (072). The firm, light brown sandy-silt (085) was 0.10m thick (*c.* 3.48m AOD at its deepest point), 0.87m wide and 2.51m long, gently sloping towards East at the eastern end of (075). It had occasional burnt patches of silt and clay. The deposit (072) which was found covering the western end of (075) was a firm, mid greyish-brown sandy-silt with moderate inclusion of burnt silt and clay. It was 0.10m thick (*c.* 3.92m AOD at its deepest point), more than 1.31m wide and 1.46m long and it was laid horizontally with undulate base. There were no finds in either deposit.

Both layers of (059) and (072) were truncated by an oval shaped, 0.25m deep (*c.* 3.97m AOD at base), more *c.* 1.00m wide and 1.50m long cut of a hearth or pit [080], which had moderately steep sides and concave base. Its single fill (081) was firm, mixed colour (light grey, red and black) sandy-silt with frequent charcoal and burnt silt inclusions. The colour of the fill indicated the spread of heat, discolouring the fill to light grey, red and black, respectively from top to base. There were no finds recovered from here.

Deposits (072) and (085) also lay under a gently east sloping deposit (074). This was a compact, light to mid grey sandy-silt with occasional burnt blocks of silt and clay. It measured 0.25m thick (*c.* 3.41m AOD at its deepest point), more than 1.12m wide and 2.58m long. No finds were recovered, and it was overlain by a layer of gently east sloping, 0.49m thick (*c.* 3.55m AOD at its deepest point), 1.15m wide and 4.30m long, firm, light brown sandy-silt (084). Cattle-size animal and sheep bone fragments, sherds of mixed Saxo-Norman to 13th-14th century pottery and a small, stone, late Saxon - early medieval spindle whorl were recovered (Appendix 2). It was covered by a moderately east sloping layer of firm, mixed colour (red, brown and grey) sandy-silt (083) with moderate, mid-size blocks of burnt silt. It was 0.55m thick (*c.* 3.55m AOD at its deepest point), more than 1.28m wide and 3.67m long with no finds. This layer sat under deposit (073) at its western and (086) at its eastern end. Deposit (073) was a westerly sloping layer encroaching into (072). It was a compact, 0.12m thick (*c.* 4.02m AOD at its deepest point), more than 1.23m wide and 2.16m long, mid greyish-brown sandy-silt

backfill with occasional patches of burnt silt and clay. The deposit (086) was east sloping and consisted of firm, light to mid brown sandy-siltwith occasional patches of burnt silt and small charcoal flecks. It was 0.33m thick (*c.* 3.96m AOD at its deepest point), more than 1.28m wide and 1.39m long. No finds were retrieved from these deposits.

Features on the central area of the site
(Fig. 12-13-14; Plate 11-14)

A group of features (two linears and a pit) were found at the centre-west of the site, forming a crescent, aligned northwest-southeast. These were cut into a compact, yellowish-brown sandy-silt layer (004) of the saltern mound. The layer of (004) has been allocated to all the machine finds on the site therefore an assemblage of seventy-seven sherds from fifty-nine vessels have been associated with it. Most of the vessels were dated to the Saxo-Norman to medieval period except for a post-medieval sherd. Further finds consists of two clay pipe stems, late post-medieval iron hinge, and a Rhenish lava stone. Bone fragments of cattle, sheep, pig, dog, sheep- and cattle-size animals were also found in (004) along the northern half of the site (Appendix 2).

The irregular/elongated cut of the pit [094] was found at the centre of the crescent formation with gentle breaks of slope, gently sloping sides, and undulating base. It was 0.34m deep (*c.* 3.74m AOD at base), 1.21m wide and 3.3m long. It had four fills, the earliest of which was a compact, mid greyish-brown silty-sand (097) without any inclusions. It was 0.14m thick, more than 0.20m wide and 0.83m long. This was covered by another, compact, mid greyish-brown sandy-silt fill (096), which was 0.16m thick, more than 0.20m wide and 1.41m long. This was overlain by a compact, 0.90m thick, 1.15m wide and 1.18m long, dark greyish-brown silty-sand backfill (098) which had a single sherd of a Saxo-Norman Oolitic-tempered jar of *c.* 11th to mid-12th century, the only find recovered from the pit (Appendix 2). The upper deposit in the pit was a compact, 0.13m thick, 0.75m wide and 0.77m long mid reddish-brown sandy-silt (095).

A northwest curving linear was found next to pit [094], where three slots were excavated. Its western terminus [043] was slightly curvilinear with steep sides, flat base and sharp brakes of slope. It measured 0.35m deep (*c.* 3.83m AOD at base), 0.92m wide and 1.10m long. The earliest of its two fills (045) was a firm, 0.15m thick, more than 0.50m wide and more than 0.90m long, yellowish-brown, fine sandy-silt with occasional small, rounded lumps of baked clay. This was covered by a 0.25m thick, more than 0.50m wide and more than 1.05m long, firm, dark bluish-grey, coarse sandy-silt (044), also with lumps of baked clay. This contained a single, fragmented bone of a cattle-size animal (Appendix 2).

The central section of the linear, [046] was slightly curvilinear with steep sides, irregular/flat base, sharp break of slope at its top and gradual at its base. It measured 0.39m deep (*c.* 3.74m AOD at base), 1.00m wide and more than 1.00m long. The earliest of its two fills was a firm, 0.39m thick, 0.45m wide and more than 1.00m long, light yellowish orangish-brown sandy-silt (048) with moderate rounded baked clay, fragments of hand-made bricks and occasional pottery sherds from the Saxo-Norman period (Appendix 2). It was overlaid by a firm to compact, 0.26m thick, 0.70m wide and more than 1.00m long, dark bluish-grey coarse sand with occasional burnt clay. There were no finds recovered from this fill.

The south-eastern terminus of the linear [049], was slightly curvilinear with moderately steep sides, flat base, and sharp brake of slope at the top and base. It was

0.50m deep (*c.* 3.77m AOD at base), 0.98m wide and more than 2.70m long. There were three deposits found here, of which the earliest (052) was a firm, 0.30m thick, 0.95m wide and more than 2.70m long, light-yellowish-brown sandy-silt with occasional small lumps of fired clay, and frequent lumps of greyish clay. Two small sherds of medieval pitchers were recovered from the fill (Appendix 2). This was overlaid by a thin layer of plastic, 0.05m thick, 0.90m wide and 1.40m long orangish-grey sandy-clay backfill (051) with occasional small, red iron patches and small, angular stones. The upper deposit of the terminus was a friable, 0.32m thick, 0.90m wide and more than 2.20m long, mid-dark greyish-yellowish-brown coarse sandy-silt backfill (050) with fired clay lumps.

The linear recorded southeast from the pit [094] had a slot taken at its north-western terminus [128]. This had gradual breaks of slope, moderately steep sides, and concave base. It measured 0.17m deep (*c.* 3.87m AOD at base), 0.81m wide and more than 1.47m long. Its only deposit (127) was firm, mid-greyish-brown sandy-silt backfill with moderate inclusions of burnt silt and occasional small flecks of charcoal. Two sherds of early medieval pottery and a fragment of a bone of a sheep size animal were found here (Appendix 2). The middle section of the linear, at cut [130], had gradual breaks of slope, steep sides and concave, nearly "V" shape base. The base was measured at 3.46m AOD at its deepest point, which was 0.55m deep from ground surface. It was 1.47m wide and more than 1.20m long and contained three fills. The earliest of these was a firm, 0.23m thick, 1.16m wide and more then 1.20m long mid-greyish-brown sandy-silt (129) with moderate inclusions of burnt silt and occasional small flecks of charcoal. There was a small sherd of a Saxo-Norman jar recovered from this fill. This was overlaid by a firm, 0.14m thick, 1.17m wide and more than 1.20m long, nearly compact mid-grey sandy mineralised silt deposit (131), which had no finds. The upper deposit in the section was a firm, 0.29m thick, 1.09m wide and more than 1.20m long, mid-greyish-brown sandy-silt backfill (132) with occasional burnt silt and charcoal inclusion. The recovered finds consisted of fragmented bones of chicken, fish, and sheep-size animals; also, sherds of a large, shallow bowl or dish and a collard jar or pitcher, both dated to the Saxo-Norman period (Appendix 2).

The south-eastern terminus of the linear [140], had gentle breaks of slope, gradually sloping sides and undulating base. It was 0.29m deep (*c.* 3.95m AOD at the deepest point), 1.04m wide and more than 1.00m long. Its only deposit (141) was compact, mid/dark greyish-brown sandy-silt backfill with a single, glazed, 11th to 12th century pottery sherd and an intrusive, post-medieval iron hinge strap (Appendix 2).

A series of west sloping deposits was found at the centre-east of the site where a *c.* 9.20m long, *c.* 1.80m wide and *c.* 0.55m deep (*c.* 2.93m AOD at the deepest point) slot [146] has been opened for investigation (Fig. 14). Three deposits were recorded here, of which the earliest was a compact, 0.15m thick (*c.* 3.38m AOD at its base), more than 1.50m wide and 2.73m long, yellowish-brown sandy-silt (145) with occasional small charcoal flecks. It was covered by a compact, 0.48m thick (*c.* 2.93m AOD at its deepest point), mixed colours of dark-grey, yellow, orange and brown sandy-silt (144) with occasional small fragments of clam shells, small patches of burnt silt and moderate, small flecks of charcoal. This was the only deposit in the slot with archaeological finds in the form of small sherds of 11th-12th century pottery and two fragmented cattle bones (Appendix 2). This deposit was overlaid by a compact, 0.33m thick (*c.* 3.00m AOD at its deepest point), more

than 2m wide and more than 1.80m long, mottled yellowish-brown sandy-silt (143) with occasional small flecks of charcoal.

Features on the north-western edge of the site (Fig. 15-16; Plate 15-19)

A group of five pits/possible hearths [025], [087], [133], [136] and [138] was found at the north-western edge of the site. This was the area in close proximity to the highest point (*c.* 4.49m AOD) of the saltern mound.

The irregular cut of a pit [138] with sharp breaks of slope, steep sides and undulate/concave base was recorded close to the western edge of the site. It was 0.34m deep (*c.* 3.86m AOD at base), 1.19m wide and 1.53m long. Its compact, mid-yellowish-brown sandy-silt backfill (139) had no archaeological finds.

An irregular shaped, 0.15m deep (*c.* 3.79m AOD at its deepest point), 0.74m wide and 1.53m long cut of a pit [136] with gentle breaks of slope, gradually sloping sides and undulating but nearly flat base, was found northeast of the pit [138]. Its backfill (137) had no archaeological finds within. It was recorded as a compact, mid-yellowish-brown sandy-silt.

The remaining three pits were found closer together than the previous two. The sub-circular pit [087] had gradual breaks of slope, undulating base, and moderately steep sides. It was 0.63m deep (*c.* 3.99m AOD at its deepest point), 0.91m wide and 1.97m long. There were three deposits recorded here, of which the earliest (089) was a compact, mid greyish-brown silty-sand backfill with sherds of 12th century wheel-thrown jar or bowl. This was the only deposit in the pit with finds (Appendix 2). It was covered by a compact, light yellowish-brown silty-sand (088) which was sealed by the upper deposit of the pit, a compact, mid reddish-greyish-brown sandy-silt (090).

Immediately north of pit [087] was the irregular shaped pit [025] with steep sides, concave base and gradual breaks of slope. It was 0.27m deep (*c.* 4.13m AOD at its deepest point), 1.25m wide and 1.28m long. The earliest of its two deposits was firm, mid-brown sandy-silt (024) without noticeable inclusions. The latest was firm, reddish-brown sandy-silt (093) with frequent burnt silt and clay and occasional charcoal flecks. None of the fills contained finds.

The more central pit [133] had an irregular shape with gradual break of slope at its top and gentle break at its base, gently sloping sides and undulating base. It measured 0.26m deep (*c.* 4.19m AOD at its deepest point), 1.4m wide and 2.05m long. It contained two deposits, of which the earliest was compact, light yellowish-brown sandy-silt (135); the latest was a compact, dark reddish and greyish-brown sandy-silt backfill (134). None of the fills contained finds.

Features in the northwest corner of the site (Fig. 17-18; Plate 20-25)

A linear ditch, c. 52m long and 2.50m wide ([023], [021], [010], [108] and [142]) was recorded in the north-western corner of the site, entering to the site at its eastern edge and exiting at its northern limit, aligned to southwest - northeast. (Fig 17-18)

A small, 0.24m deep (*c.* 3.90m AOD at its deepest point), 1.56m wide and more than 1.00m long, linear gully [017] was truncating the steep sided, flat based ditch [023] at its southwestern end. Two slots had been excavated and a cross section at the terminus. At the former, the gully had steep sides, undulating base, sharp breaks of slope at the top and gentle breaks of slope at the base. It was aligned northeast - southwest. There was only one deposit found here, which was compact, yellowish

mid-brown sandy-silt backfill (016) with moderate small fragments of shells. Bone fragments of cattle and sheep/goat, sherds of a brown-glazed bowl of late 17th-18th century and two pieces of late post-medieval iron handle were found here (Appendix 2).

The gully had steep sides and flat base at its terminus [019], truncating the linear ditch [021] at its southern limit. Its brake of slope was sharp at the top and at the base. It was 0.11m deep (*c.* 3.67m AOD at its deepest point), 0.50m wide and more than 1.46m long. Its fill (018) was compact, mid yellowish brown sandy-silt with occasional small flecks of charcoal. No finds were recovered from the terminus.

To the northeast of the terminus a slot across the ditch [010] was 0.16m deep (*c.* 3.58m AOD at its deepest point), 0.75m wide and more than 1.00m long, with gently sloping sides, concave base, sharp break of slope at the top and gentle break at the base. Its single fill was friable, mixed greyish-brown sandy-silt with moderate burnt clay fragments and occasional small flecks of charcoal. No finds were recovered from this deposit.

The natural (003) was found 0.87m deep from the ground surface at *c.* 2.88m AOD in the slot. There was a series of waste silt layers of the saltern mound recorded here, of which the earliest was a compact, 0.40m thick (*c.* 2.95m AOD at its deepest point), more than 1.20m wide and more than 2.00m long, yellowish-brown sandy-silt (015) with occasional burnt clay fragments. It was covered by a compact, 0.48m thick (*c.* 3.30m AOD at its deepest point), more than 1.62m wide and more than 2.00m long, greyish mid-brown sandy-silt (014) with occasional small flecks of charcoal and occasional small burnt silt. Several, mid/late 12th and early/mid-13th centuries sherds of thirteen vessels and fragments of cattle and cattle-size animal bones were recovered from this deposit. It was overlain by a compact, 0.33m thick (*c.* 3.41m AOD at its deepest point), more than 2.00m wide and more than 2.00m long, light yellowish-brown sandy-silt (013) with occasional small burnt silt blocks. Sixteen sherds of mid to late 12th century pottery, cattle and cattle-size animal bone fragments were found in the deposit (Appendix 2).

Also cutting (013) was an oval shaped waste pit [012] with steep sides and concave base. Its break of slope was sharp at the top and gentle at the base. It was 0.18m deep (*c.* 3.58m AOD at its deepest point), 0.50m wide and more than 0.32m long. It was aligned to southwest - northeast and contained a friable, dark greyish-brown silty-sand fill (011) with large, occasional, solidified organic silt blocks, occasional medium and small burnt clay blocks and moderate, small charcoal flecks.

Cutting into deposit (147) which contained which contained two 12th century pottery sherds and horse, cattle and sheep bone fragments, another slot was excavated at the central part of the linear at [142]. The The linear had four fills at the slot of which the earliest was a compact, 0.06m thick (*c.* 3.39m AOD), 1.68m wide and more than 1.00m long, dark greyish-brown sandy-silt (152). This was overlain by a compact, 0.26m thick (*c.* 3.45m AOD at its base), 1.59m wide and more than 1.00m long mid-greyish-yellowish-brown sandy-silt (151). It was covered by a compact, 0.48m thick (*c.* 3.45m AOD at its base), 1.18m wide and more than 1m long mid-greyish-brown sandy-silt (149). The upper fill of the linear was a compact, 0.43m thick (*c.* 3.58m AOD at its base), 3.10m wide and more than 1.00m long mid-yellowish-brown sandy-silt (150). None of the fills of the linear at [142] produced archaeological finds.

6. DISCUSSION

The natural deposit was recorded to be compact, rusty yellowish-brown sandy-clay, which was overlain on the northern half of the site by a compact, yellowish-brown sandy-silt deposit of a medieval saltern mound.

The site was ideal for salt production as Surfleet is situated in the Fenland within the estuary of the once tidal River Glen, one of the locations recorded in the 1086 Domesday Survey with salter activities, amongst towns such as Spalding and Pinchback.

The archaeological features on the site were pointing towards salt production activities, however the evidence recorded is limited to a substantial size spoil mound, associated with the dumping of desalinated silt. Silt mounds were the by-products of the salt-processing called "sand-washing", a progressing method coming into general use from the Late Saxon/Early Medieval times, dynamically replacing the Iron Age/Roman method of heating brine, taken directly from the sea. The two types of methods are well represented in Marshchapel, which is located on the Marshland of Lincolnshire, but yielded salterns from the Roman to the Late Saxon periods (Lane 2018).

During the sand-washing process in the inland, following the Spring tides, the dried, salt-rich sand or mud derived from the estuary of the rivers had been scraped-up and placed into clay-walled pits or filtration units, which were filled with turf or straw at their base. The mud had been washed through with brine or fresh water and filtered by the turf. From the Roman period onwards, the strengthen salt-water was boiled over hearths in lead containers to evaporate the excess water, while the waste silt was heaped up on mounds. (Lane 2018)

The salt-waste mounds became obvious landmarks of the area, and as the salterns ceased their production, the mounds had become pastures, then plough-fields or had been built-on, slowly losing their prominence on the landscape. This process certainly left its mark on the mound, found on the site.

The main body of the mound was generally built up by fine sandy-silt, while layers of raked-out waste material of hearths were found laid on waste silt at the edges of the mound. Three accumulations of the discarded hearth-floor waste were recorded along the eastern edge of the site, while a group of features with similar deposits (two ditches with a pit between them) was situated at the centre of the site, forming a crescent shape. Pottery sherds of 10^{th}-12^{th} century, derived from the earliest layers of these discarded deposits, predating the lowest, 13^{th}-14^{th} century layers of the silt-waste mound.

The stratigraphy of the mound indicates periodical utilisation of the area. The sequence of the build-up of the mound suggests that the silt-waste layers were dumped into a hollow area, perhaps created by small heaps of desalinated silt and raked-out waste of hearth flooring. Only a small layer of silt-waste deposit was recorded at the centre of the mound, which progressively became thicker towards the outskirts. The now oval shape hollow was immediately overlaid by a thick deposit of predominantly domestical waste, which indicates a temporary break in the raise of the mound. Nearly at the centre of the hollow, a well or a deep rubbish pit was dug, which was also backfilled by domestical waste. The resume of the saltern works produced another layer of desalinated silt, filling up the hollow completely.

The archaeological material derived from the layers of raked-out hearth flooring found in the southern and eastern edge of

the mound include 10th-12th century pottery sherds of domestic vessels, such as large, shallow bowls or small pitchers, but also a small assemblage of hammerscale and brick/slab fragments.

Ditching waste on saltern site was not unprecedented, dumped waste thrown down on the side of silt-waste mounds was recorded in Quadring, Lincolnshire, where the work-surface was situated on the top of the mounds (Lane 2018).

The earliest layers of the mound were associated with salt-making activities. These were layers of silt-waste derived from filtration units, containing occasional fragmented finds of domestic ware such as jars, bowls, or pitchers of 13th-14th century date.

Iron smelting

Further finds from the earliest deposits of the mound include undiagnostic furnace slags and a fragment of possible plano-convex bottom derived from the base of non-tapping furnace of bloomery smelting, which generally produced substantial amount of molten slag. Non-tapping furnace was commonly used in the Iron Age and following a short pause in the Saxon period. Contrary to the tapping furnace where the molten waste slag drained out from an opening at the bottom of the furnace, in the non-tapping furnace the slag settled into a pit beneath the furnace and solidified into lumps and blocks. With the re-appearance of the tapping furnace around the 9th century, the use of non-tapping furnaces gradually diminished and stopped by around the 10th century. (Historic England 2018)

The furnace slags found in the earliest deposits of the mound, although fragmented, showed the character of those derived from a non-tapping furnace, such as the lack of flow patterns on the surface, what occurs when the molten slag drains out from the furnace. The plano-convex bottom is a typical by-product of the smelting and the smithing furnaces, a block of slag characterised by a flat top and convex base.

During the smelting process the porous slag accumulates at the bottom of the non-tapped furnace as a lump, sometimes called as "furnace bottom". Although it was the most common by-product of non-tapping furnaces, occasionally it accumulated at the base of tapped furnaces too, such as the examples of the 14th-15th century bloomery at Minepit Wood, Sussex and the 13th century bloomery at Stanley Grange, Derbyshire indicate (Historic England 2015).

In case of smithing, the slag accumulates beneath the blowing hole or tuyere, formed on the hearth wall rather than in the bottom of the hearth (Crew 1996).

The origin of the recovered fragment of possible plano-convex bottom could indicate the stage of metalworking on the site, being at smelting or smithing process, although differentiate them is difficult. Furthermore, the two activities do not rule out one another.

The presence of a plano-convex bottom perhaps indicates the use of non-tapping furnace preserved well into the 13th century, which would make it a unique example or could have been derived from the base of a tapping furnace as it happened occasionally.

The large blocks of slag and the presence of possible plano-convex bottom are suggesting a low-scale smelting and perhaps smithing activity. The slags did not bare marks of visible abrasion, which suggest that these were produced locally.

Pause in the salt-production

The earliest silt-waste deposits of the

mound were covered by a thick deposit of predominantly household or farmstead waste, which was abundant in archaeological finds. The collection of remains consisted of a modest group of 13th-14th century sherds of domestic ware such as jugs, jars and bowls in various sizes and another fragment of a plano-convex bottom (pcb), derived from a non-tapping furnace. The deposit also contained two edge flakes of a handmade, brick, produced with slop mould method and an abraded flake of fired clay with diagonal groove.

The most conspicuous was the amount of animal bones recovered from here. A large assemblage of bones of large-sized animals such as horse and cattle were found, but small-sized animals like sheep or goat, dog and cat were also present in the layer. Although the number of bone fragments was high compared to other deposits, the number of individual specimens recovered was low. The presence of various domestic species in the layer suggests low-scale animal husbandry in the area.

This waste deposit was significantly different from the earlier silt-waste deposits, and suggested that the salt-making, perhaps due to movement to more productive sites, has been temporarily ceased. The finds related to animal husbandry suggest the presence of a farmstead, which made use of the land between the periods of salt-making. The hollow, created by small silt-mounds of the salt-production was found to be an ideal place to dispose waste into.

Following the general spread of domestic waste into the hollow, a substantial well or refuse pit was dug at about the centre of the mound. The pit consisted of two deposits, which produced a small assemblage of 13th-14th century, domestic pottery sherds, such as jars/bowls and jug. The environmental sample indicated an abundance of charred cereal remains such as barley, wheat and probable rye, which demonstrate agricultural activity in the area. A great assemblage of hammerscales was also recorded in the sample.

The lower deposit of the pit contained most of the archaeological material, including a small assemblage of late-medieval/early post-medieval, handmade, slop and sand moulded brick. The original purpose of the bricks could not be determined. These were perhaps from a building or used for structures such as drains or cess pits.

The earliest deposit of the pit contained numerous bones derived from large-size domestic animals such as horse and cattle, but sheep or goat and dog or fox was also represented. This reflects the type of waste what generally was present in the surrounding deposit, of which the pit was dug into, and suggests low-scale animal husbandry.

Hammerscale in the sample

One element of the finds in the earliest deposit of the waste pit, the hammerscale of metalworking is notable.

Two types of hammerscale were identified on site, the flake or plate shape and the spheroidal hammerscale. The hammerscale is a highly magnetic by-product of the iron-smithing of bloom (a porous bundle of slag and iron), formed when the iron is forged. The spheroidal hammerscale is likely to be produced during high-temperature welding. Therefore, plate hammerscale is more abundant where the iron was worked rather than produced. (Bayley et al. 2008)

Due to the small size of the hammerscales (a few millimetres in length and less than a millimetre thick) these tiny flakes were collected from environmental samples.

The site had three environmental samples containing hammerscale, of which two were from the discarded layers of 10-12th century possible hearth-flooring, while the remaining one was found in the bottom deposit of the 13-14th century well or rubbish pit recorded in the centre of the mound. Latter had the largest, but still very modest assemblage with 27 plate hammerscale to 1 spheroidal, while the two other deposits produced only a single spheroidal hammerscale. All the hammerscale were recovered from dumped layers, tipped there with other waste, suggesting that they were swept-up possibly after a small-scale metalworking operation rather than an industrial one, perhaps forging of iron tools.

Salt-production resumes

The return of salt-production to the site was indicated by the re-appearance of further silt-waste layer covering the waste deposits of the hollow and completing the mound.

Only a handful of pottery sherds were recovered from the deposit, all from 13th-14th century household vessels such as jar, bowl, and jug. The number of domestic animal bones found here was also very low, only a horse and a pig bone were encountered, suggesting the salters' complete take-over of the site.

A corner flake of a handmade brick or slab with a purposely shaped arch, and a handmade, slop-moulded brick flake or slab were collected from the deposit. These were perhaps derived from a structure or stand, related to the salt-making process, as it was observed at the 15th-16th century saltern at Wainfleet St Mary (Lane 2018).

A small fragment of a possible fuel ash slag was collected from the deposit. Fuel ash slag occurs when alkali-rich ash reacts with silicates in high temperature fire, making a glassy material, called slag (Bayley 1985). Small fragments of fuel ash slags are frequently produced during smithing (Crew 1996).

High temperature fire could also indicate metalworking. Although the fragment showed the character of a fuel ash slag, it was more likely to be a low mass siliceous slag, derived from heating of silica rich materials.

Further features identified in likely association with the saltern mound were in the form of waste pits and a possible freshwater ditch, which perhaps supplied water to the filtration units of the saltern. The recovered archaeological material derived from these features represents an assemblage of 10th-13th century domestic ware, which slightly predates the pottery encountered in the main mound. These features were found at the northern half of the site.

10th-12th century waste deposits

Four potential areas of dumped raked-out hearth flooring and associated silt-waste layers could be established on site. These were located at the outskirts of the mound and consisted of several layers of spoil deposits. It suggests an orderly disposal of waste on targeted locations rather than random spreading along the site. Most of the deposits were sloping downwards, implying that these were discarded over pre-existent silt-waste mounds. The sequence of the layers indicates that while the raked-out hearth-flooring deposits were kept together, occasionally, further silt-waste was thrown on them.

The hearth flooring spoil was deposited with 10th-12th century pottery sherds of domestic use such as jar/bowl/pitcher and jug, which were predominantly found in the lower deposits. Animal bones from various domestic and some wild species were also recorded from the features.

Cattle and cattle-size animal, sheep/goat, pig, chicken bones represented the domestic species, while red deer and fish the wild ones.

Burnt crop and straw remains and low level of domestic food rubbish suggest an agricultural settlement in the proximity of the site. The limited amount of wood charcoal indicates the favour of peat or turf as fuel for the hearths, which were generally used on the Fenland, as it was abundant there.

The environmental samples taken from the waste layers found concreted silts and fine sands deposits with high concentration of salts which could point towards salt-making activities, although it could also indicate cess pit or animal waste in the area. Further samples identified concreted ash, burnt weed seeds and fired earth which could be derived from the hearth floors during the salt-extraction process.

Surface finds

Numerous 16th-19th century pottery sherds were collected from the machine stripped surface across the site. These were domestic wares of various forms such as jars, bowls, pitchers, jugs and cups. Further finds include highly abraded, hand-formed brick fragments or slags and fired clay wodges with multiple finger and thumb-pressings on both the upper and lower surfaces formed by the squeezing of a clay lump into a suitable shape for use. Altogether three fragments were found of the latter, which belonged to the same object. Amorphous lumps of fired clay, also cylinder and wedge-shape fired clay were found at the 10th century saltern at Marshchapel 2 (Burnt Hill). The function of these clay lumps could not be identified certainly, but it was assumed that they had a support role in the salt-making process (Lane 2018, p84). Although the presently recovered lumps of fired clay were surface finds, perhaps fulfilled a similar role.

The bricks or slabs were in very degraded state; therefore, the identification of their purpose could not be accurate. These were perhaps used for structures such as drains and cess pits and derived from the local farmsteads rather than associated with the saltern.

The recovered surface finds indicate that the site remained inhabited after the cease of salt-production.

Several shallow, small pits with heat-affected spoil were found truncating the mound close to its highest point, suggesting small-scale activities. The pits had heat affected fills which indicate in-situ fire in them or dumped hearth floor material.

Contribution to the East Midlands research agenda

The archaeological remains contribute to the East Midlands research agenda (Knight *et al.* 2012) by:

- Identifying a potential silt-waste mound of the salt-making industry in the area of Surfleet.
- Dating the industry here to the 10th-14th centuries, based on pottery sherds derived from silt-waste layers and possible heart-flooring associated to salt-making.
- Exploring the relationship of the saltern with local farming.
- Observing periodical extraction of salt in Surfleet.

7. CONCLUSIONS

An archaeological strip, map and sample style investigation was undertaken on the land off Sunnydale Close, Surfleet,

Lincolnshire as the site lies in an archaeologically sensitive area in the vicinity of discoveries of medieval date.

The excavation revealed a series of 10th-12th century possible raked-out hearth flooring deposits heaped on pre-existent silt-waste mounds and a substantial waste mound of 13th-14th century date, used periodically for dumping silt-waste of salt-extraction, and for domestic waste disposal. The mound presumes further remains such as filtration units and hearths may be discovered in close proximity.

The recovered finds, such as sherds of domestic vessels were dated to the 9th-14th centuries onwards to the 18th century.

8. ACKNOWLEDGEMENTS

Archaeological Project Services would like to thank Mr G Baxter and Mr A Jagger of Ashwood Homes for commissioning the fieldwork and post-excavation analysis.

Thanks are also due to Tom Lane for visiting the site and sharing his extensive knowledge on salt-making.

The work was coordinated by Paul Cope-Faulkner, who edited this report along with Neil Parker. Greg Pickup kindly allowed access to the library and parish files maintained by Heritage Lincolnshire.

9. PERSONNEL

Project Coordinator: Paul Cope-Faulkner
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Photographic reproduction: Peter Tovizi
CAD Illustration: Peter Tovizi
Post-excavation Analysis: Peter Tovizi
Archiving: Maria LeRoy

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11. ABBREVIATIONS

AOD	Above Ordnance Datum
APS	Archaeological Project Services
CIfA	Chartered Institute for Archaeologists
GSGB	Geological Survey of Great Britain
LHER	Lincolnshire Historic Environment Records

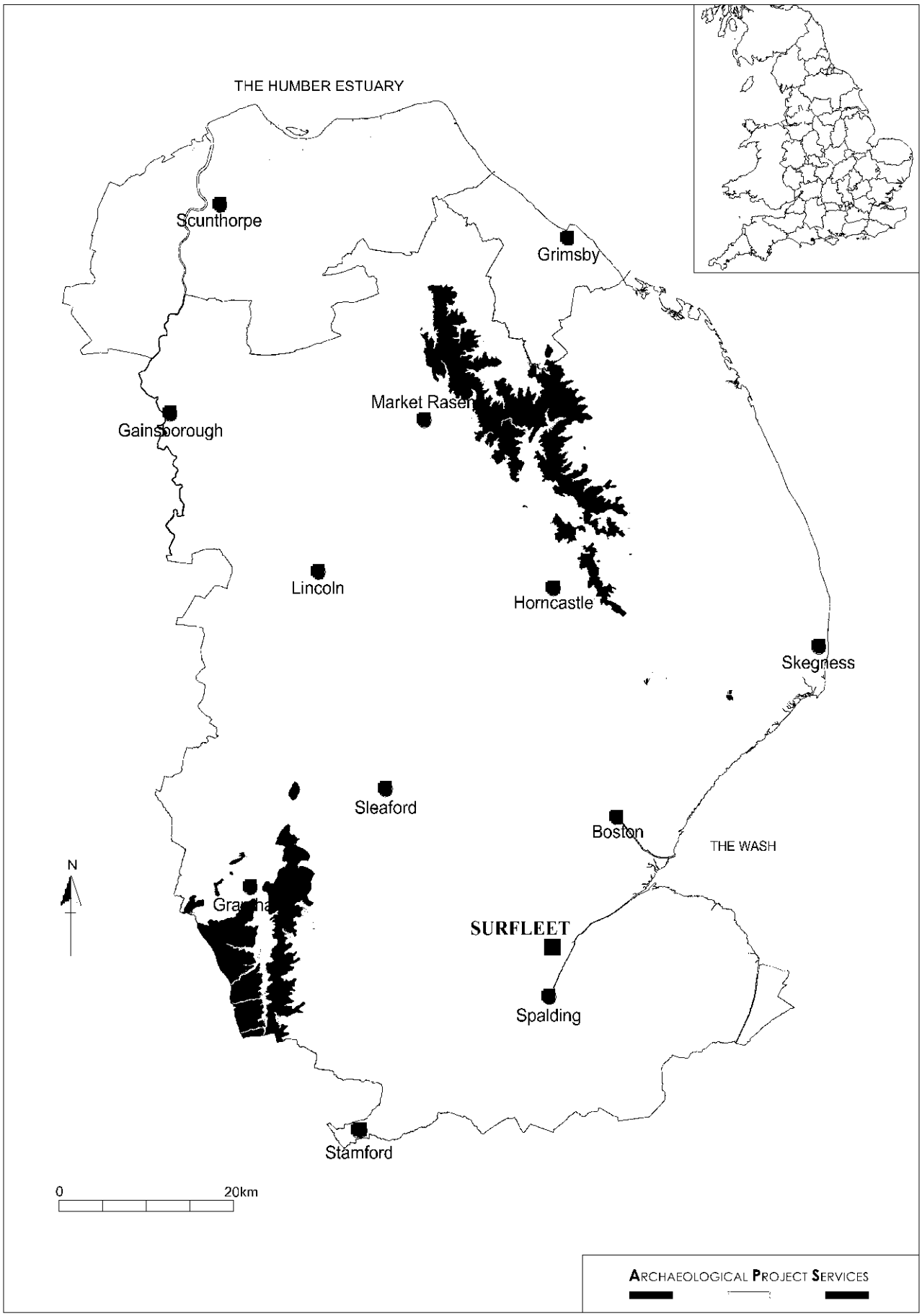


Figure 1 - General location plan

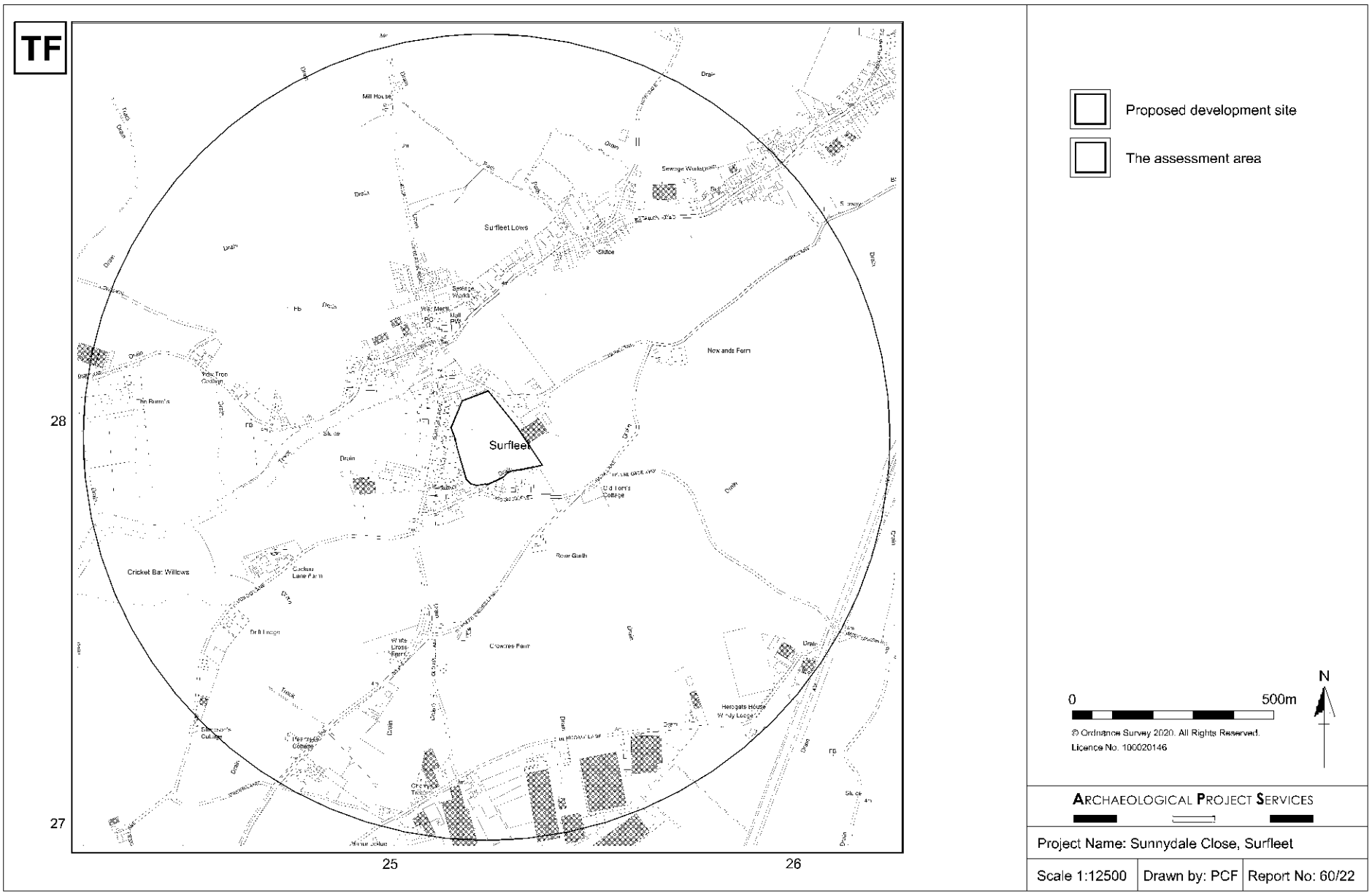


Figure 2 - The assessment area showing the proposed development site

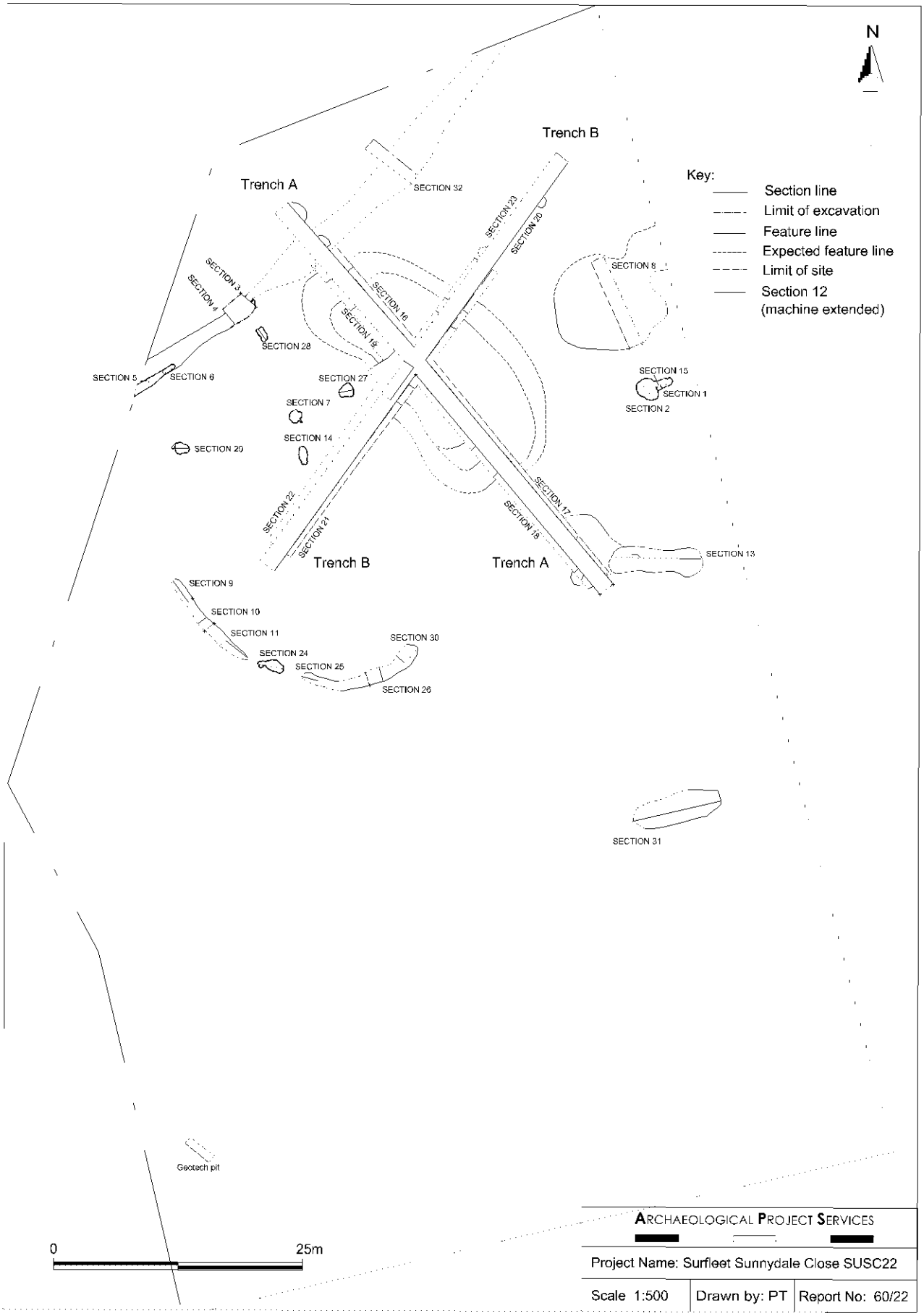


Figure 3 - Feature locations

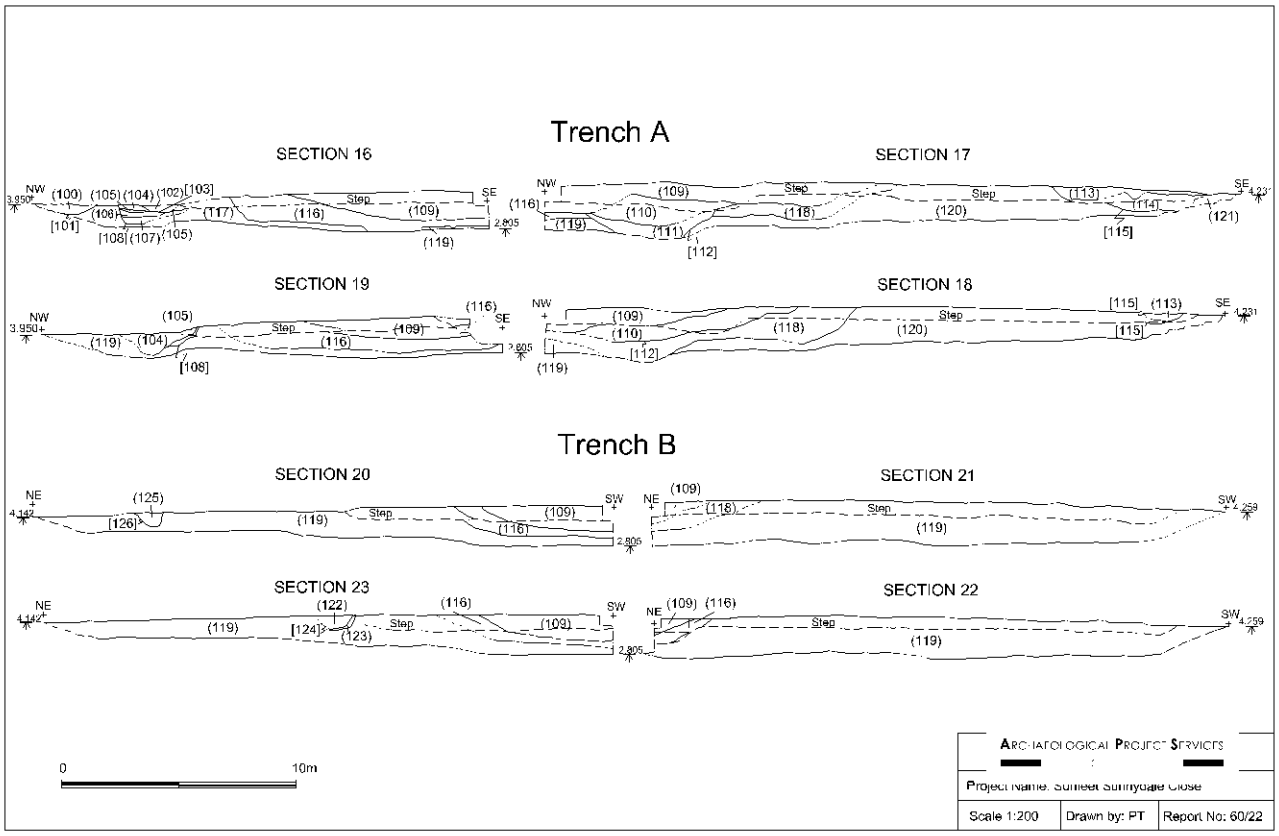


Figure 4 - Sections of Trench A & Trench B

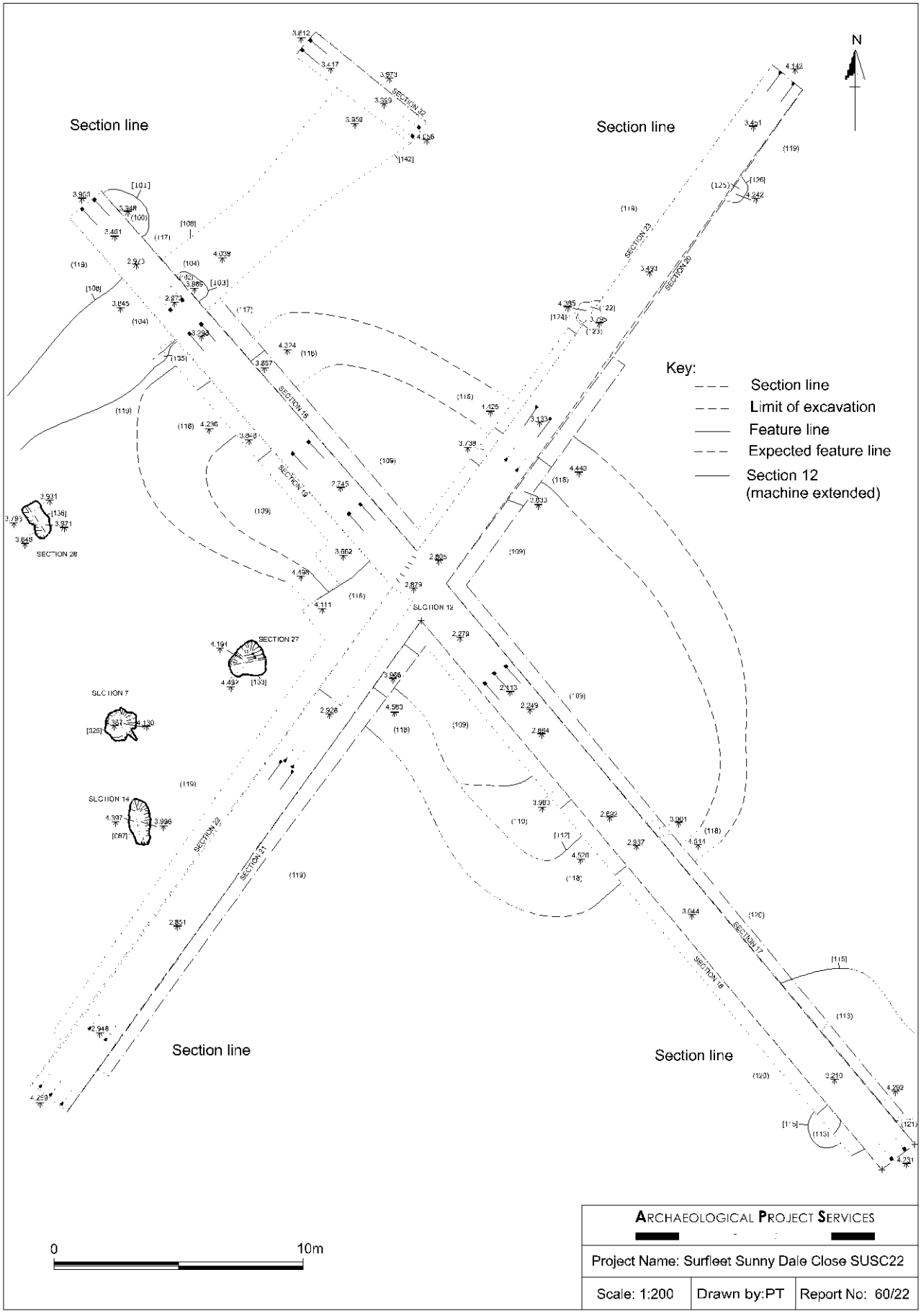


Figure 5 - Plan of Trench A & Trench B

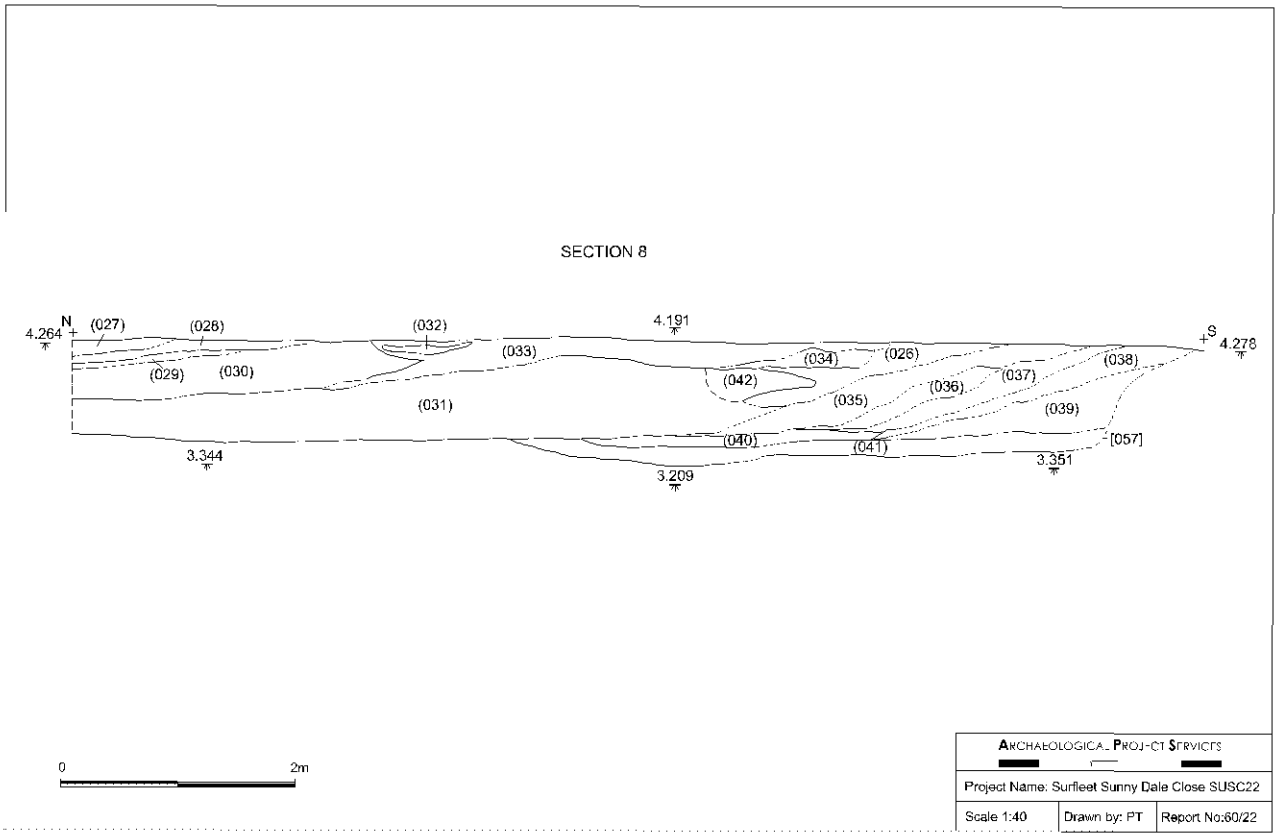


Figure 6 - W facing section of pit [057]

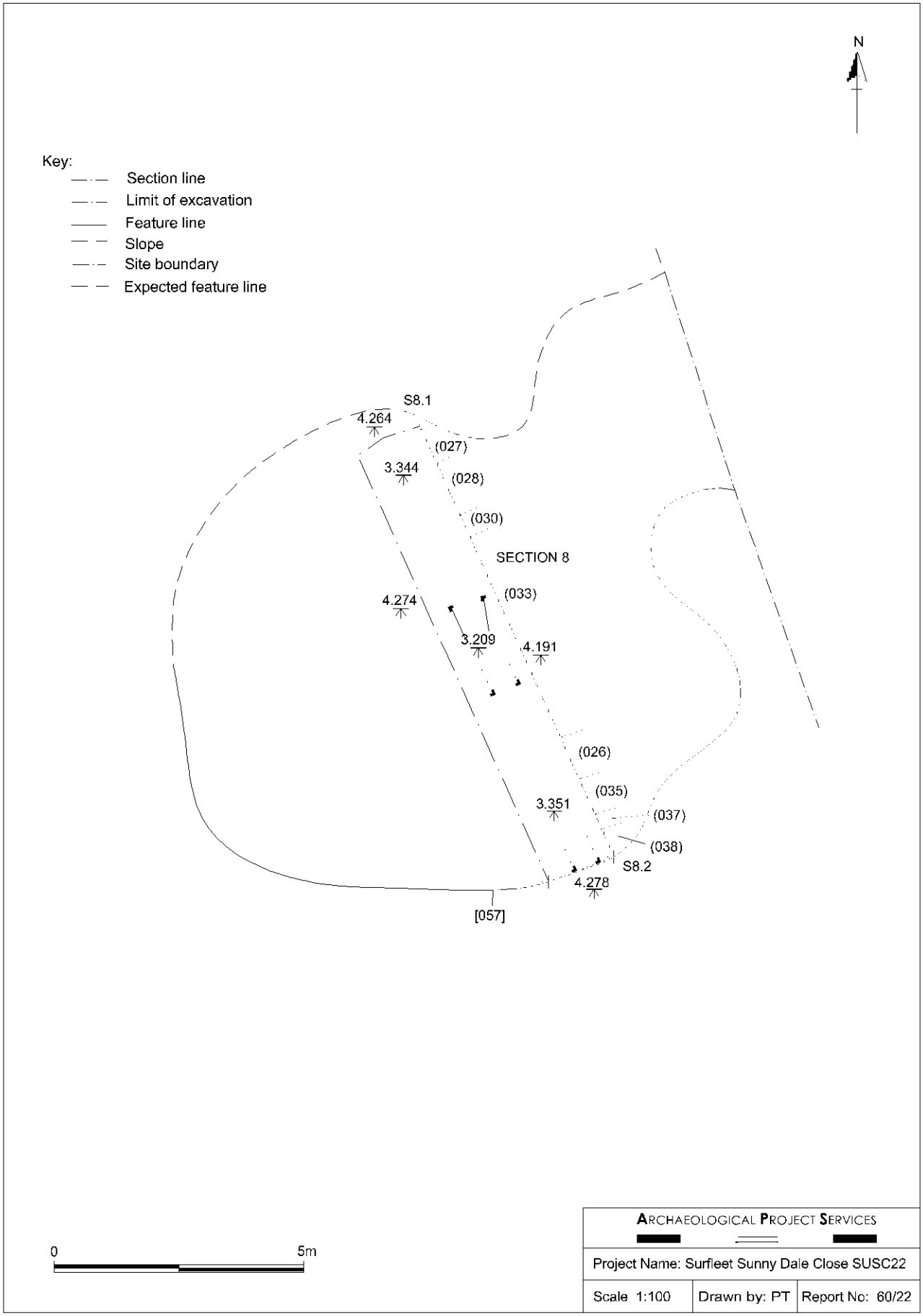


Figure 7: Plan of pit [057]

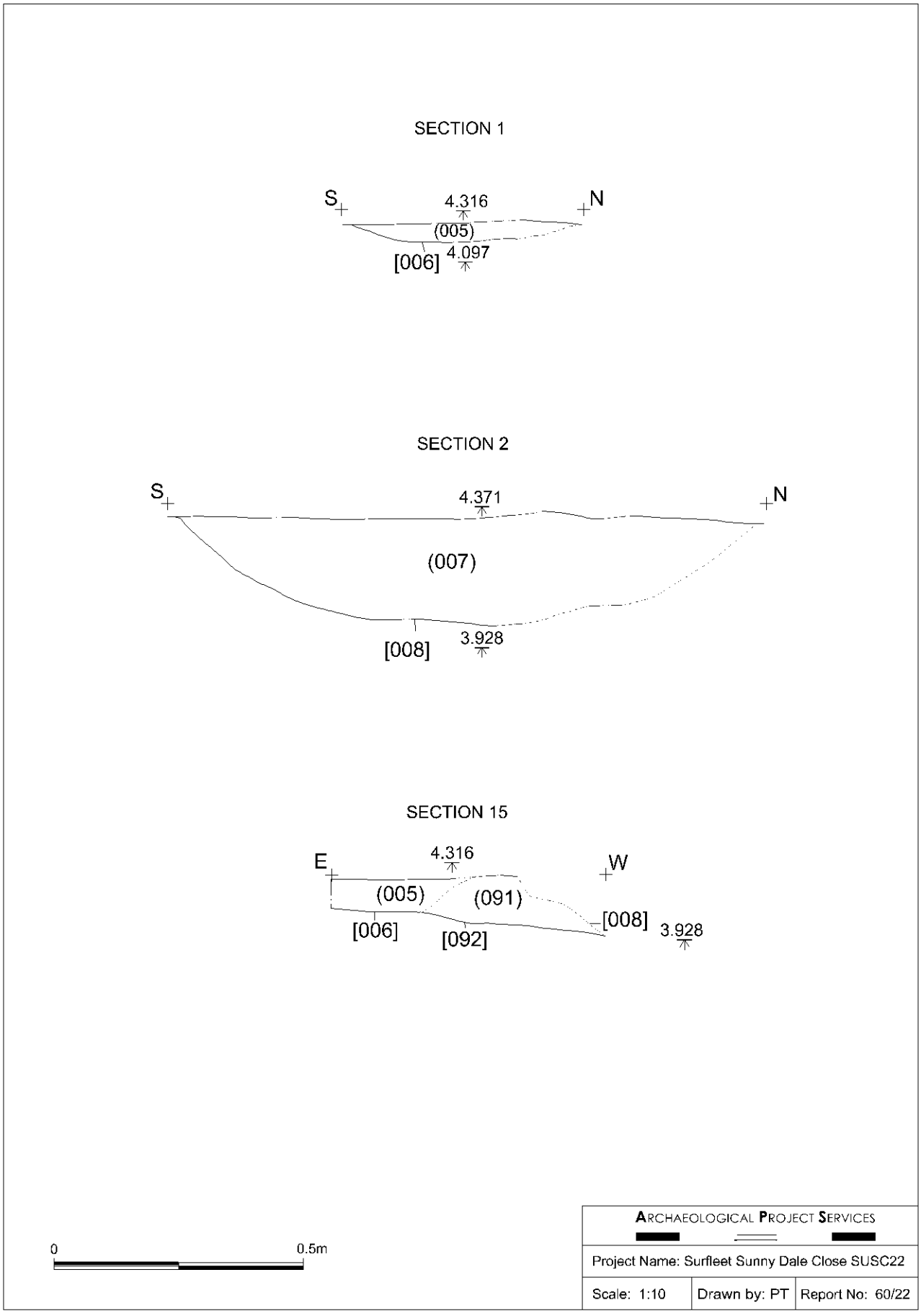


Figure 8 - Sections of pits [006], [008] and [092]

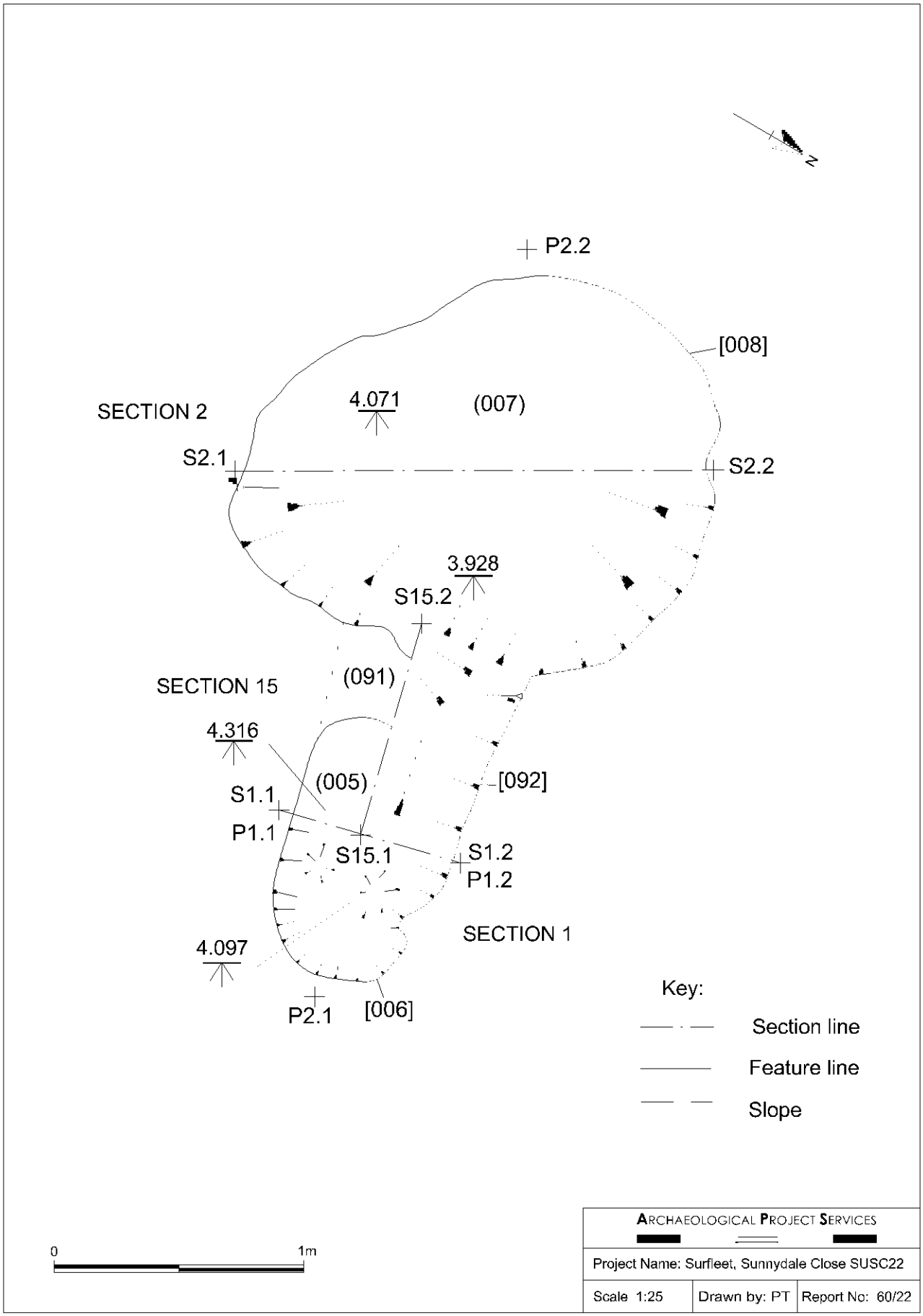


Figure 9. Plan of pits [006], [008] and [092]

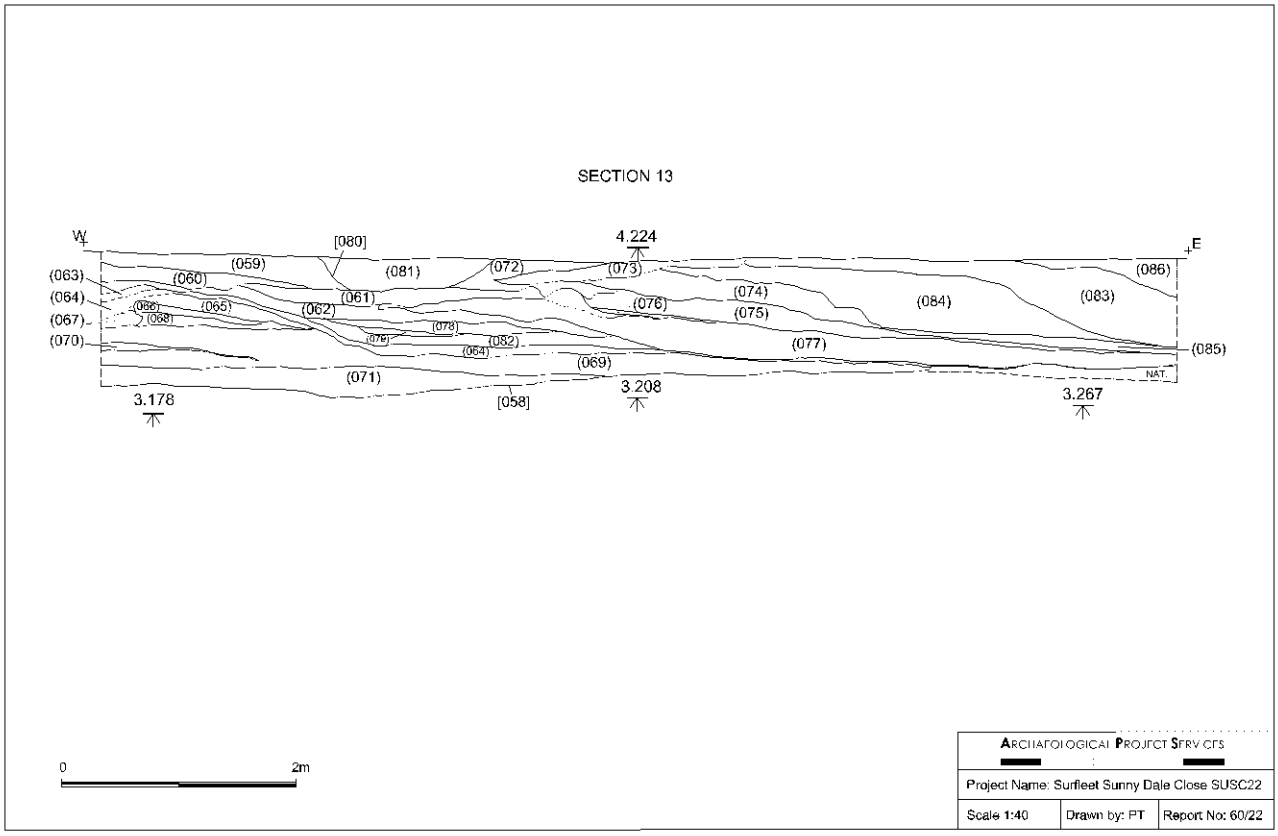


Figure 10 - S facing section of pits [058] and [080]

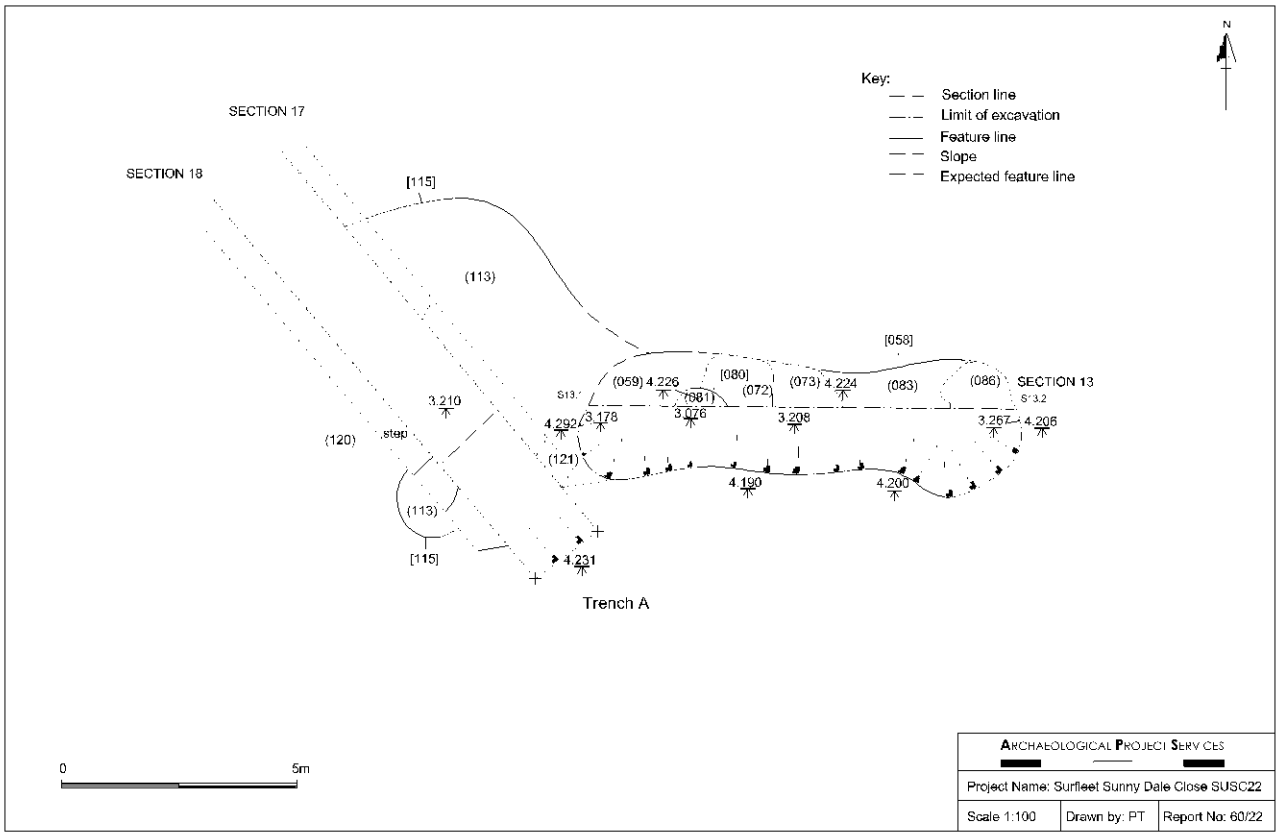


Figure 11 - Plan of pits [058] and [080]

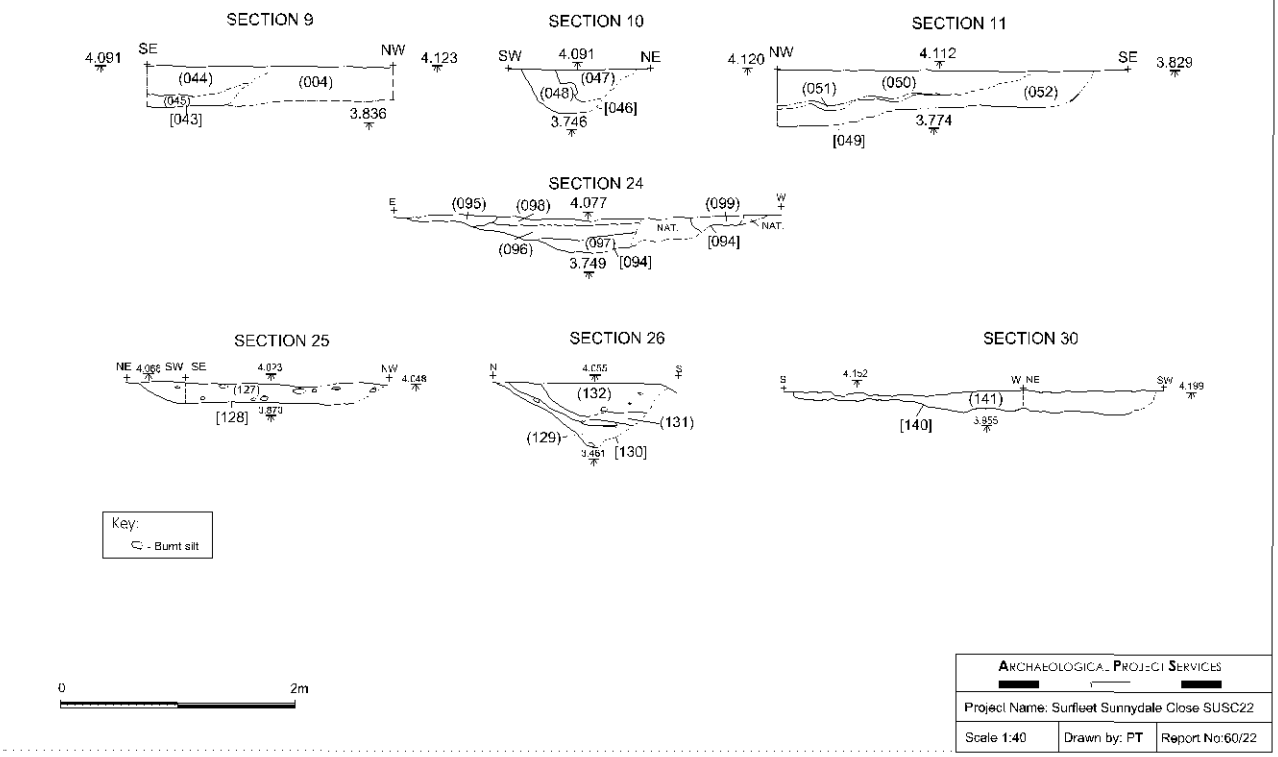


Figure 12 - Sections 9-10-11 of linear; 24 of pit and 25-26, 30 of linear

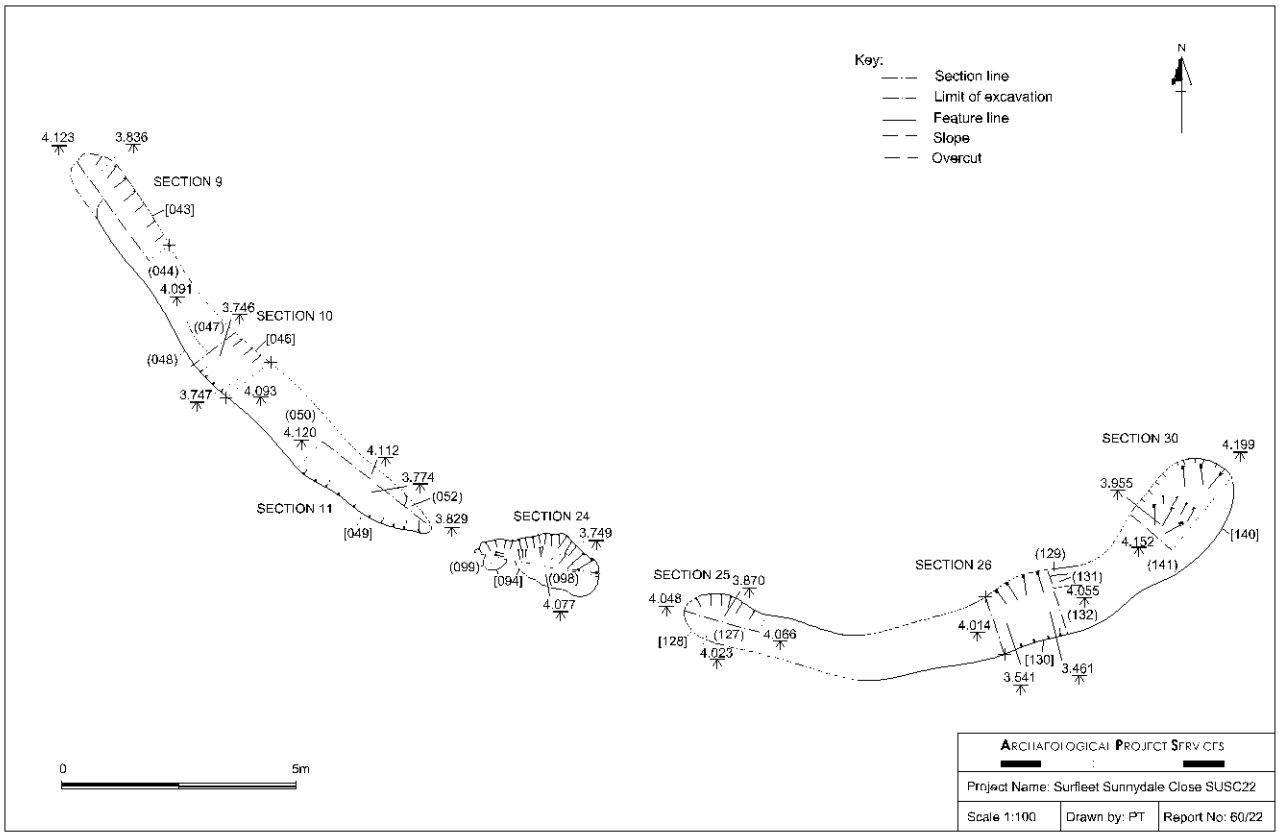


Figure 13 - Plan of lineas [043]-[046]-[049], [128]-[130]-[140] and pit [094]

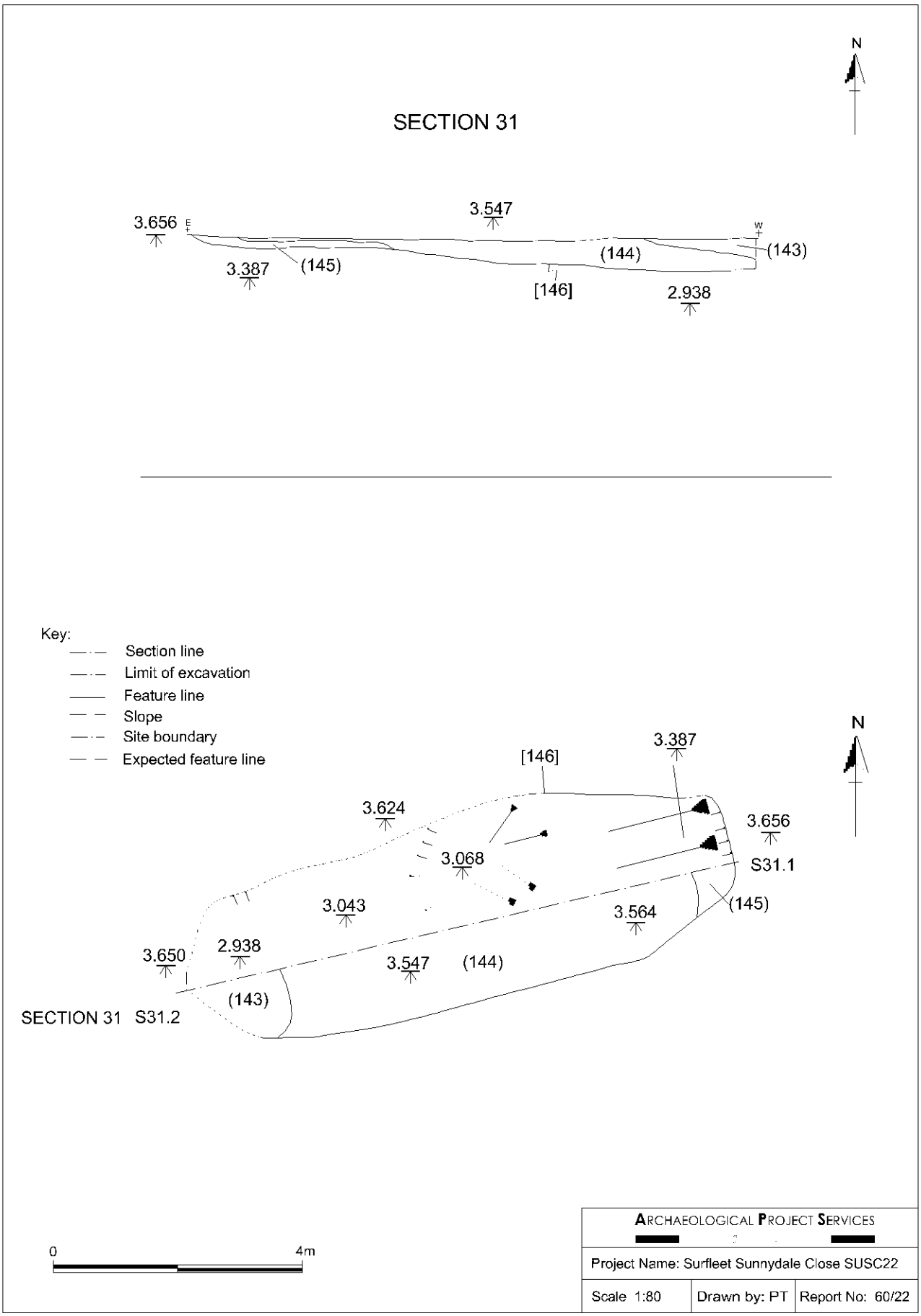


Figure 14- Section and plan of pit [146]

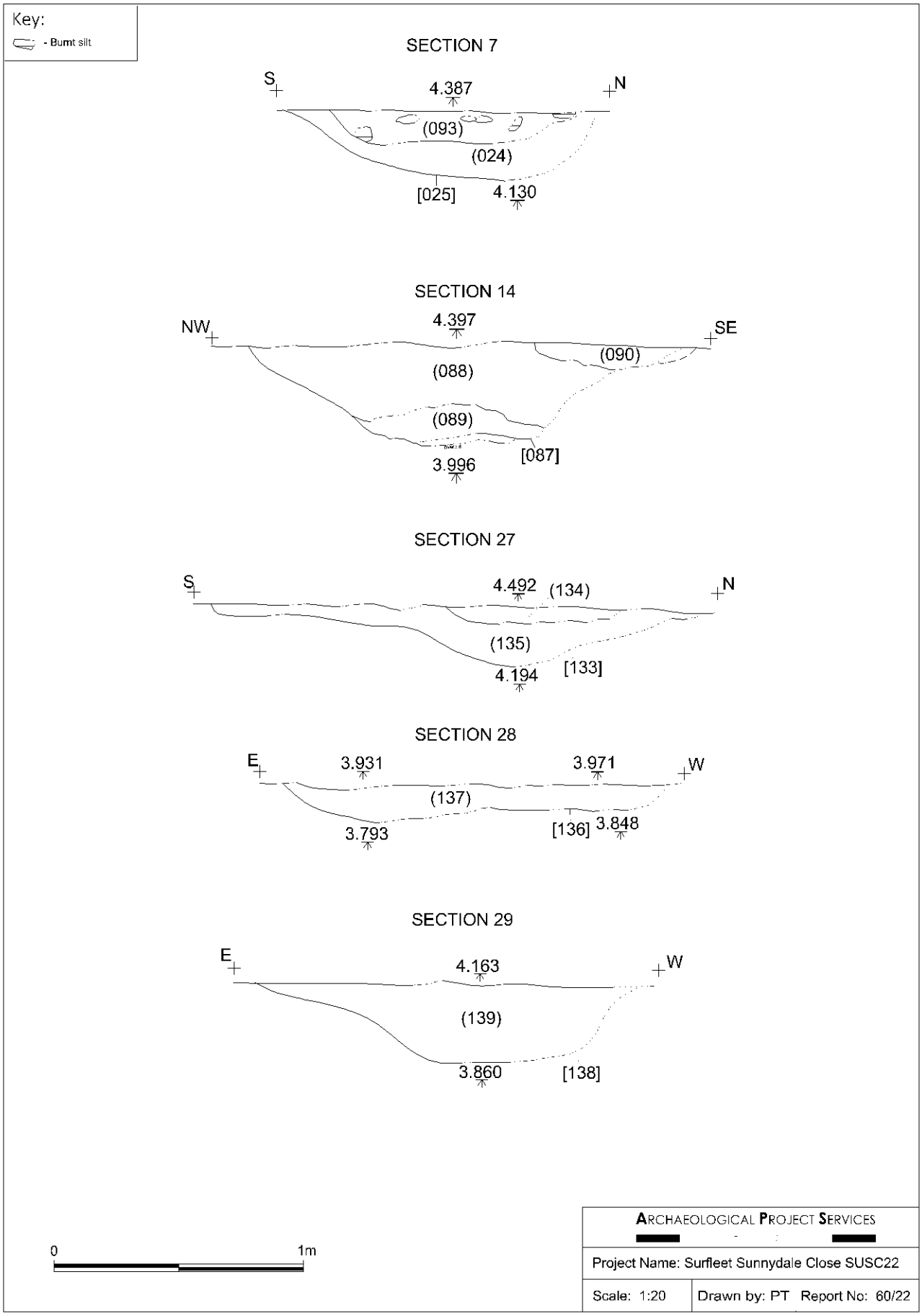


Figure 15 - Sections of pits [025], [087], [133], [136] and [138]

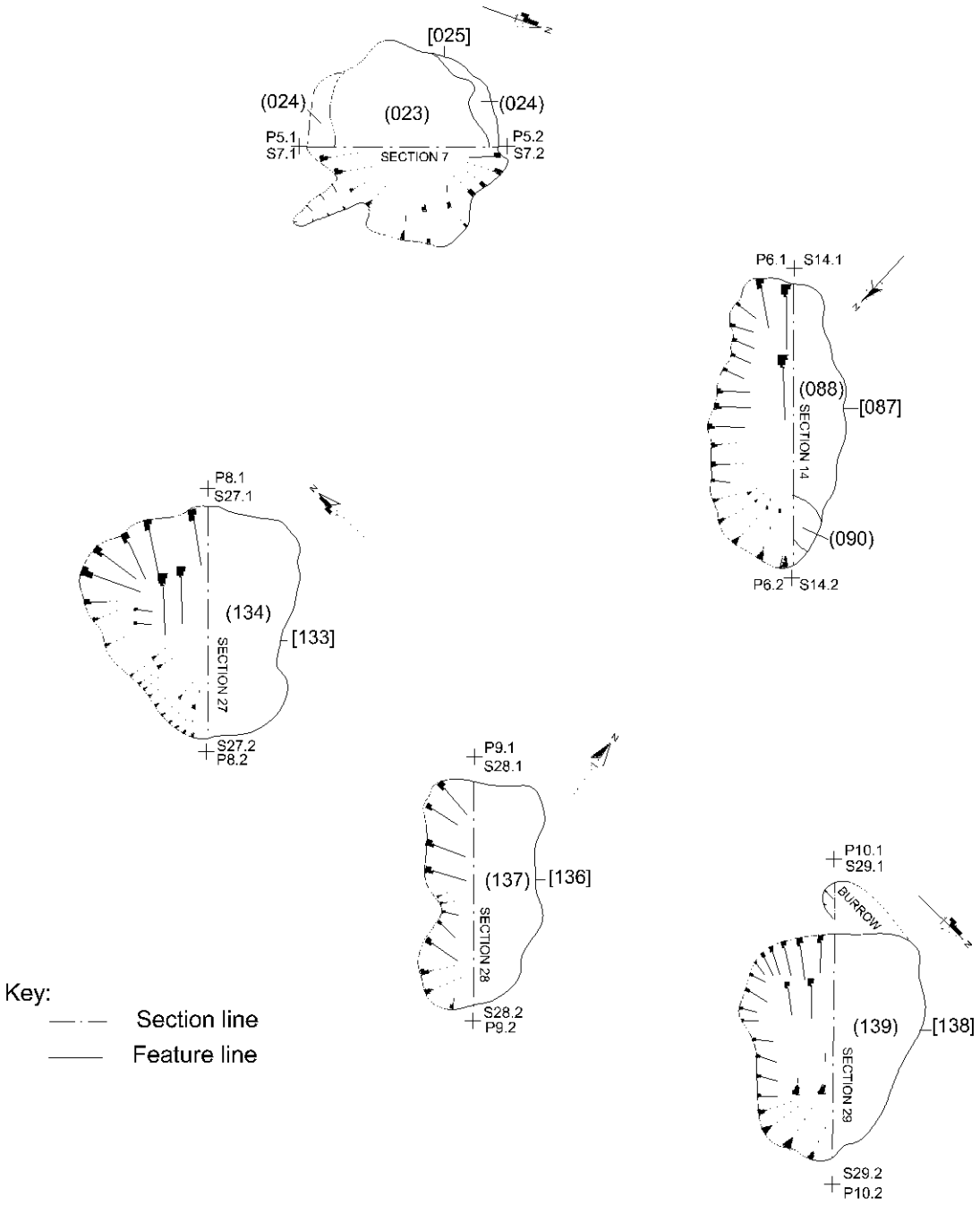


Figure 16 - Plans of pits [025], [087], [133], [136] and [138]

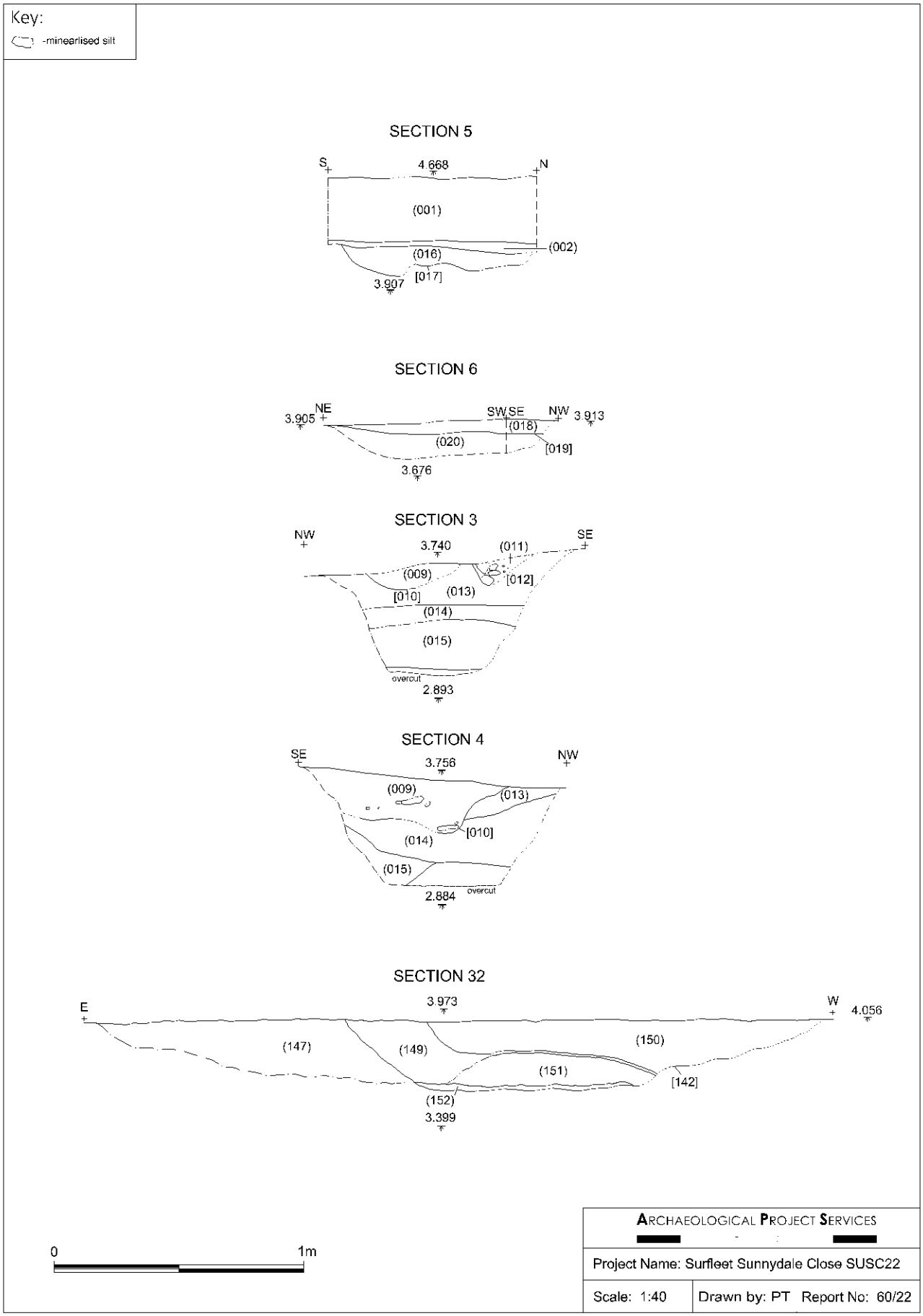


Figure 17 - Sections of gully at [017]-[019] and ditch at [010]-[142]

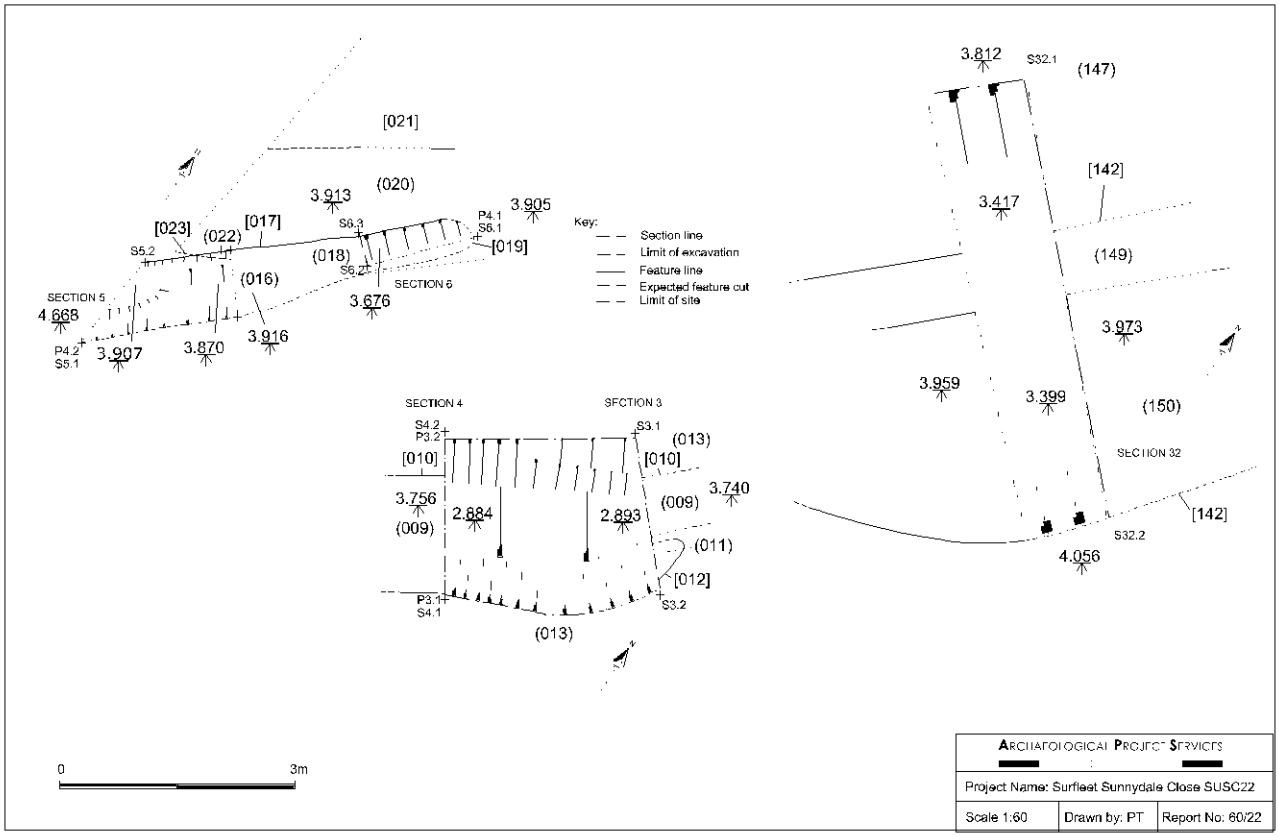


Figure 18 - Plans of gully [017]-[019] and ditch [010]-[021]-[023]-[142]

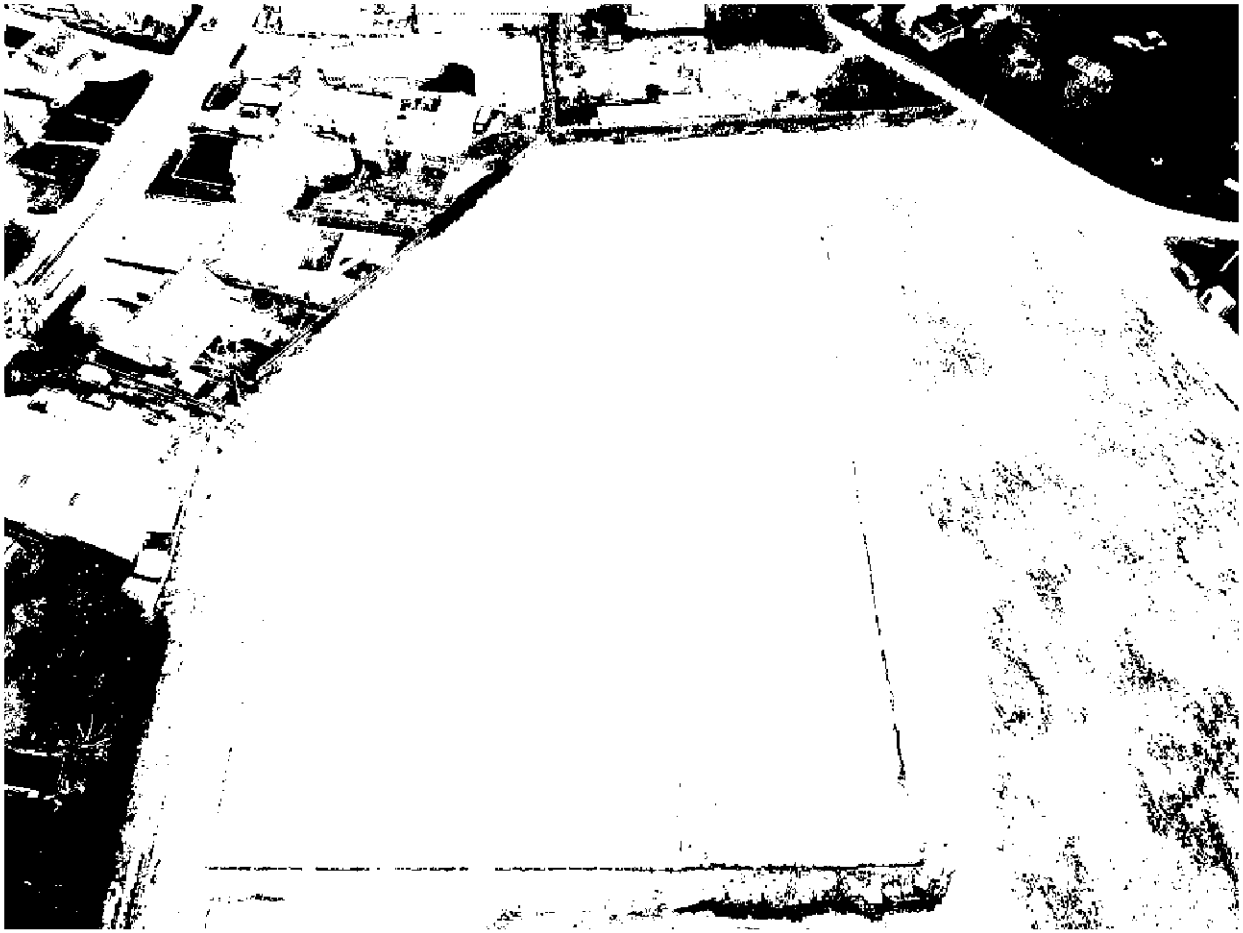


Plate 1: Pre-excavation aerial shot of the site



Plate 2: Trench A – looking SE and NW

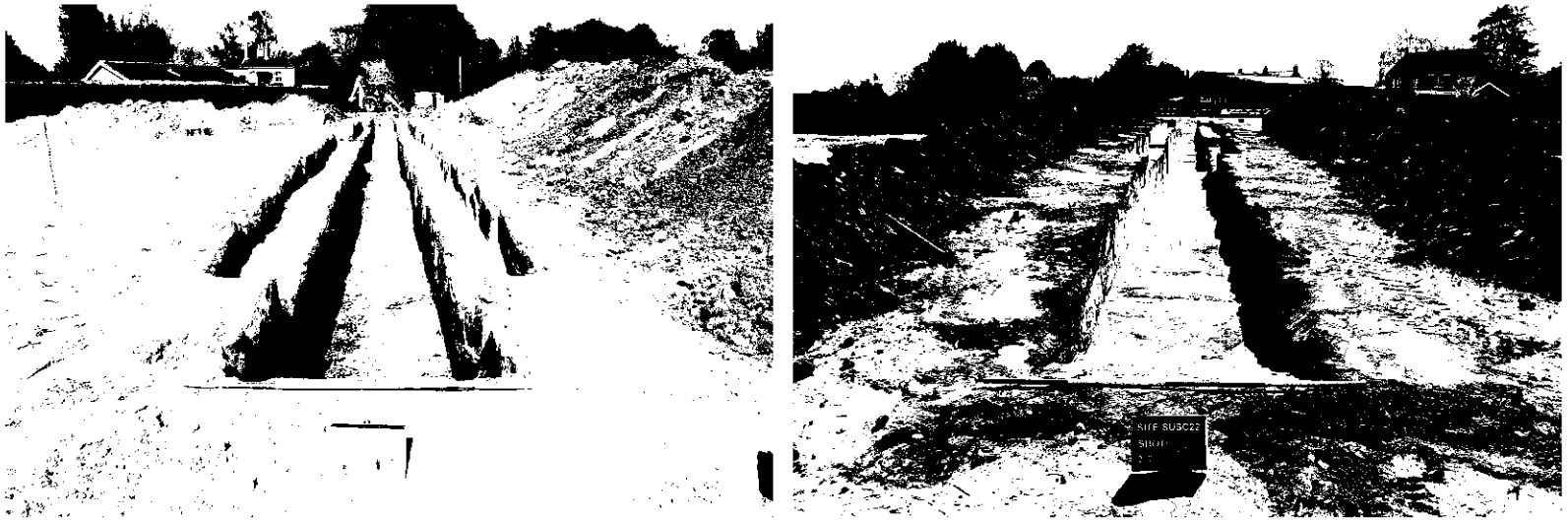


Plate 3: Trench B – looking NE and SW

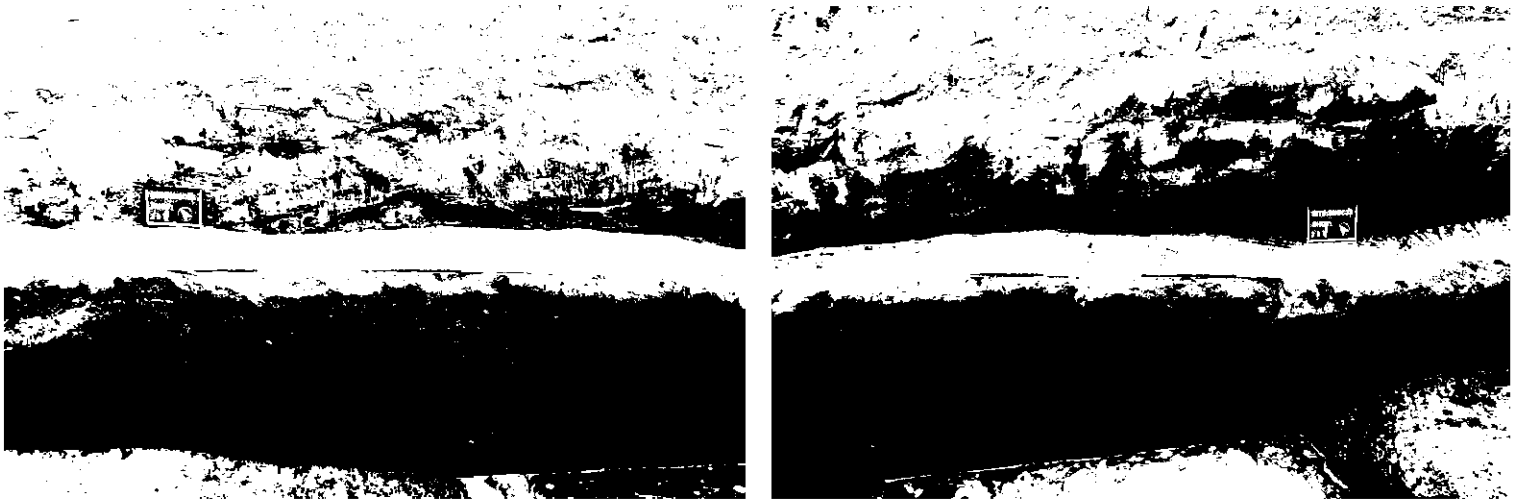


Plate 4: Cut of a well or waste pit [112] in Trench A – looking NE

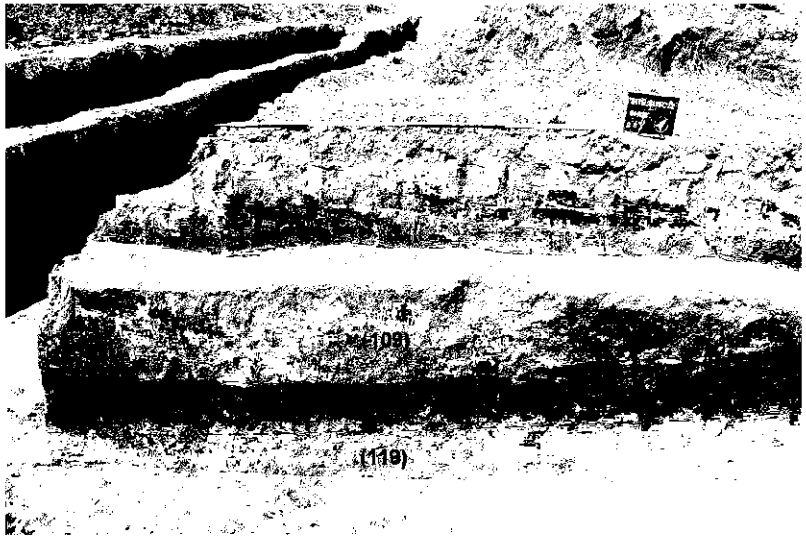


Plate 5: Section of deposits (119), (116) and (109) in Trench B



Plate 6: E facing section of a possible pit feature [057]

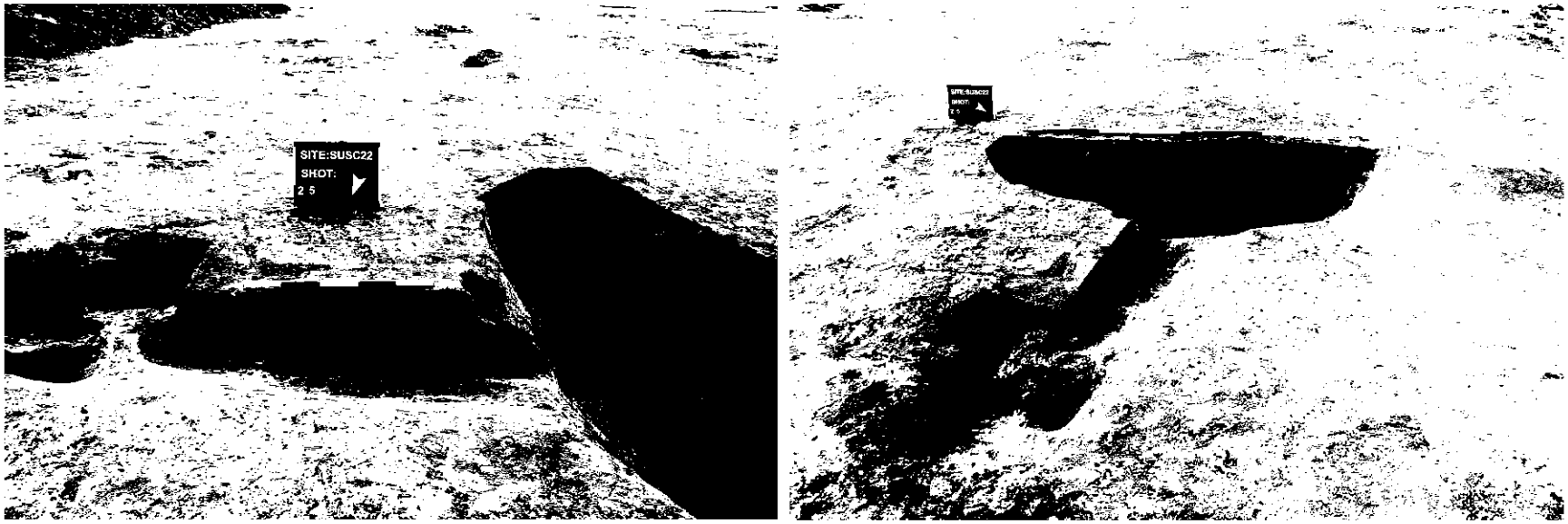


Plate 7: Relationship of pits [006], [008] and [092] from various views.



Plate 8: South facing section of pit features [058] and [080]

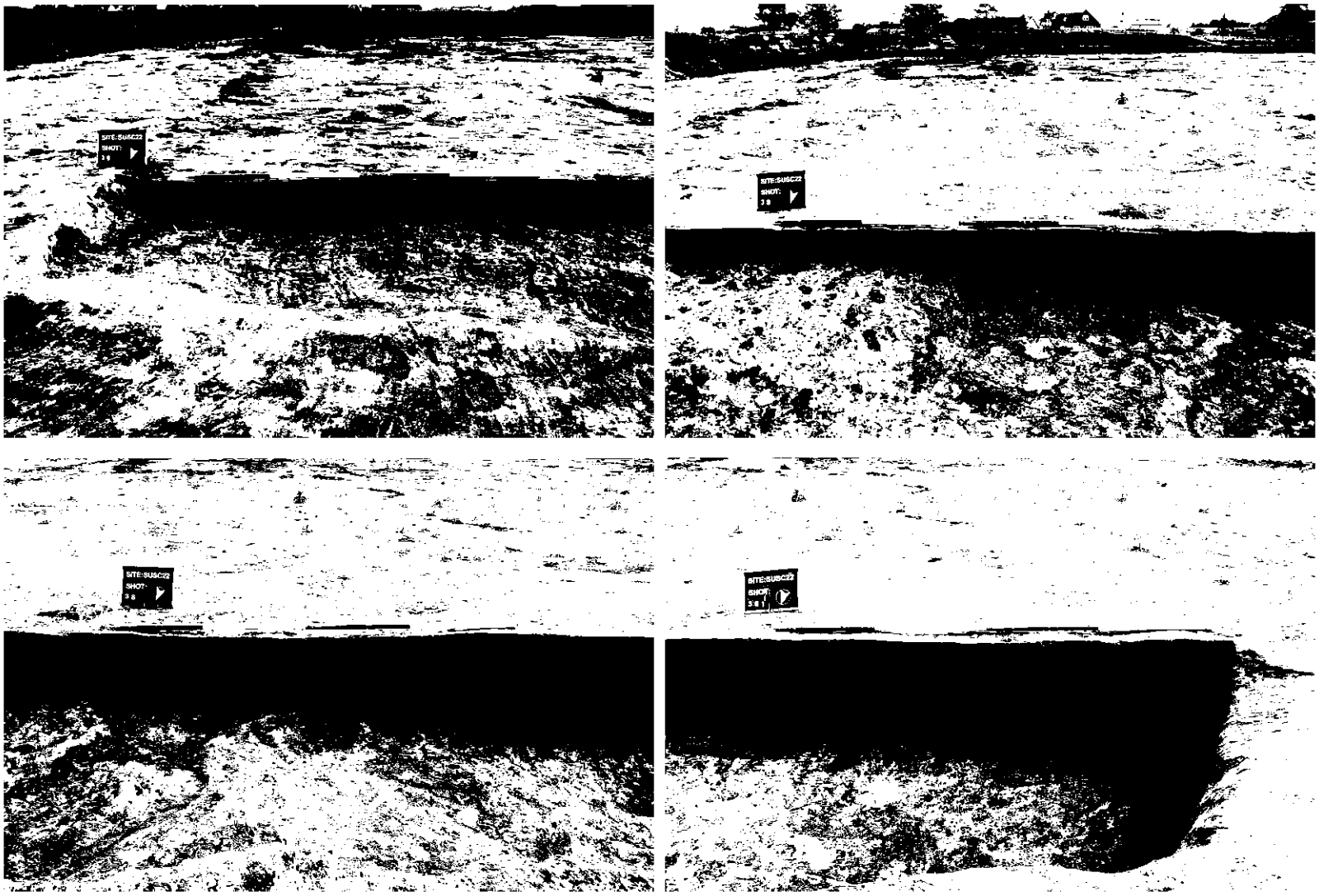


Plate 9: N facing section of pit feature [146]

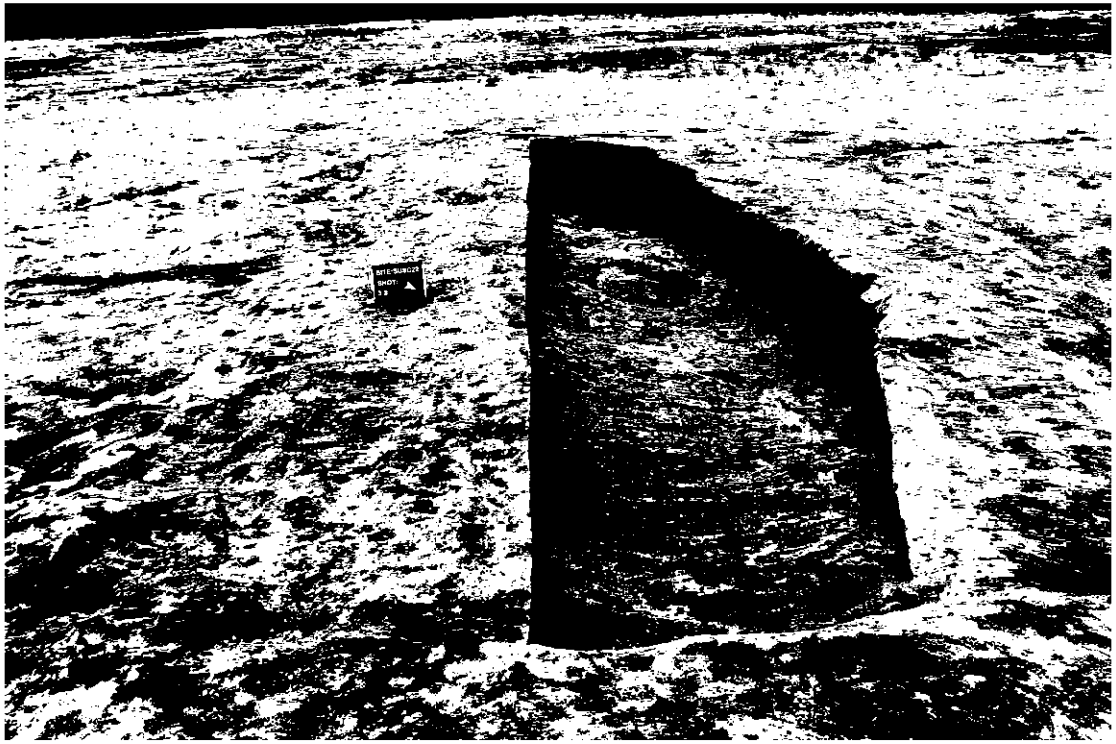


Plate 10: Plan shot of pit feature [146] – looking W



Plate 11: Sections of central linea at [049], [046] and [043] respectively at W wing



Plate 12: Plan of the western wing of the central linea at [049], [046] and [043] – looking W

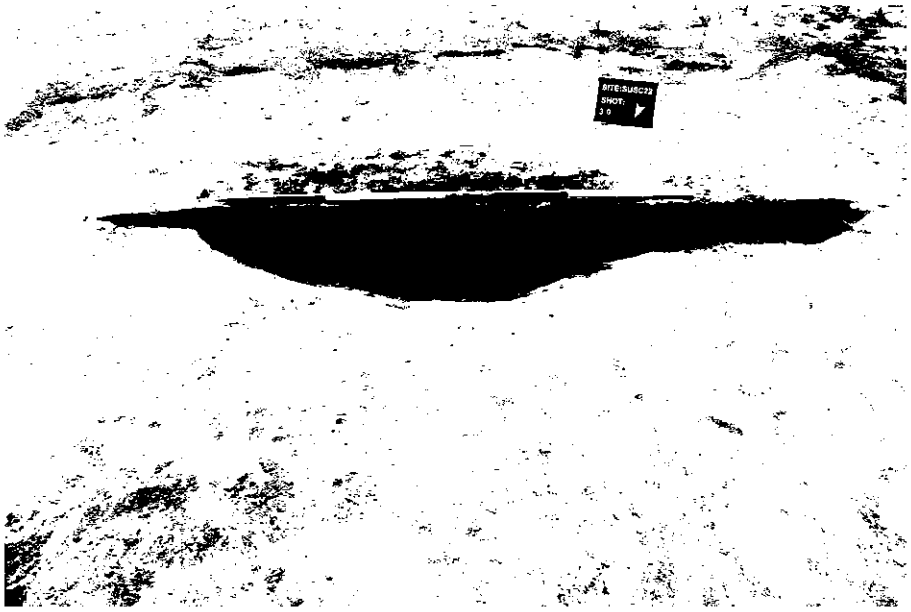


Plate 13: N facing section of pit [094] found between two lineas



Plate 14: Sections of central linea at [140], [130] and [128] respectively at E wing



Plate 15: NNW facing section of pit [133]

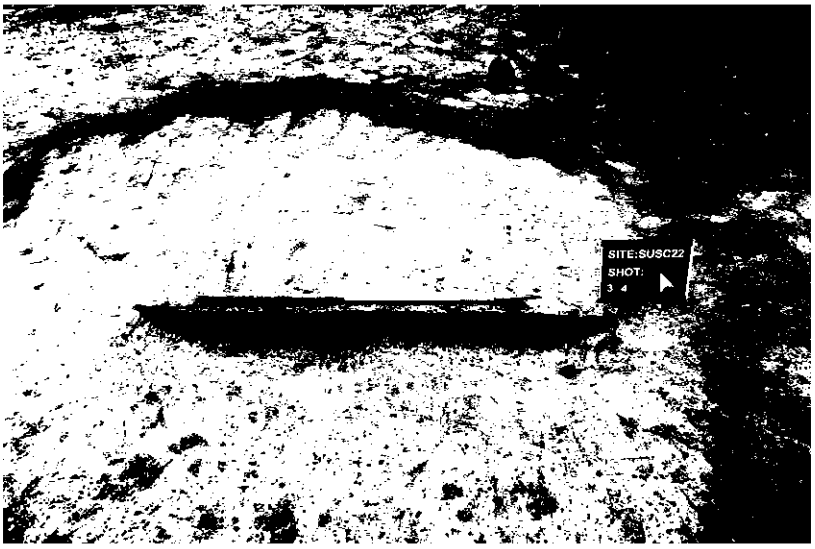


Plate 16: SW facing section of pit [136]

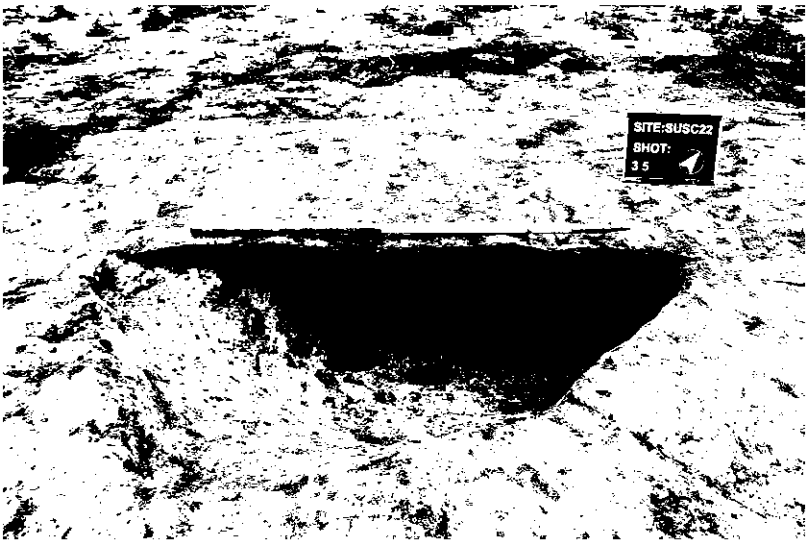


Plate 17: SE facing section of pit [138]

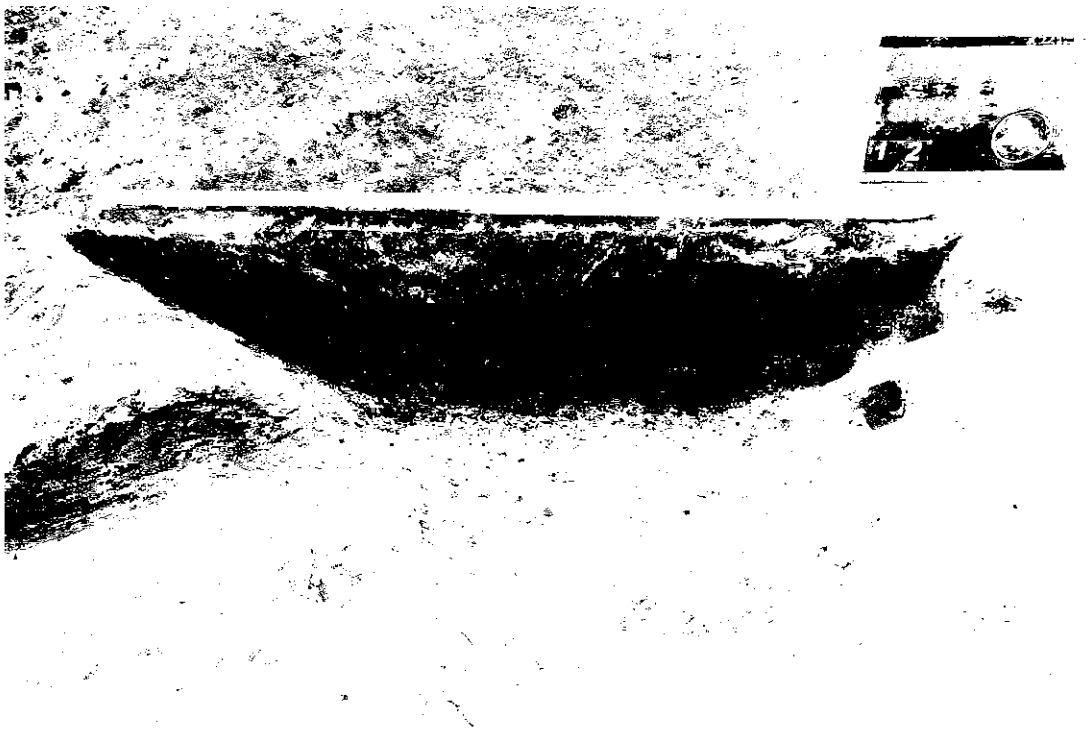


Plate 18: E facing section of pit [025]



Plate 19: NE facing section of pit [087]



Plate 20: E facing section of gully [017]

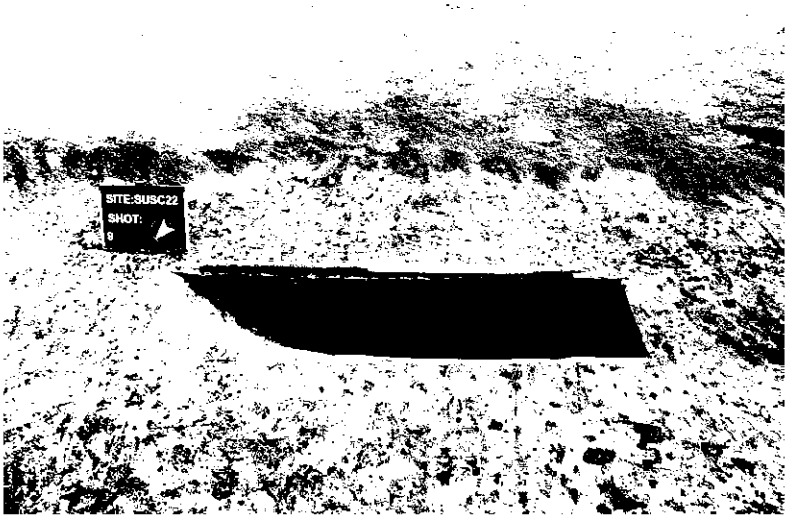


Plate 21: Folding section of gully terminus [019] – looking SE

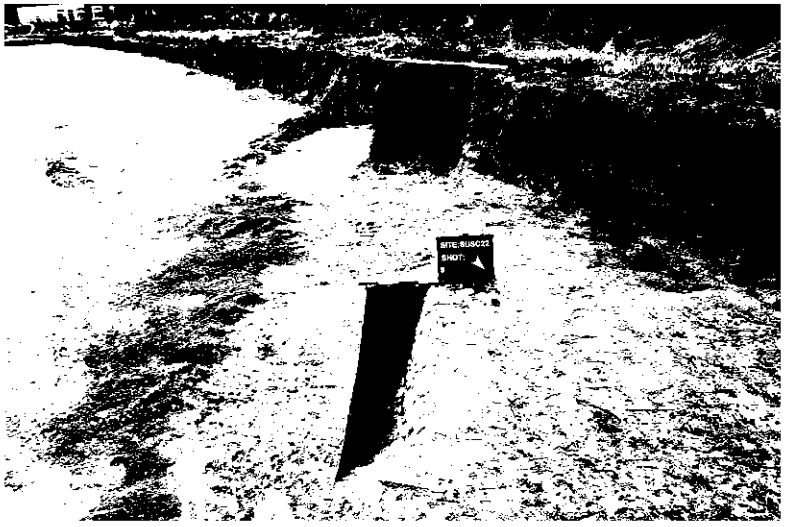


Plate 22: Plan of gully with Sections 5 and 6 – looking SW



Plate 23: SE facing section of ditch [010] and pit [012]

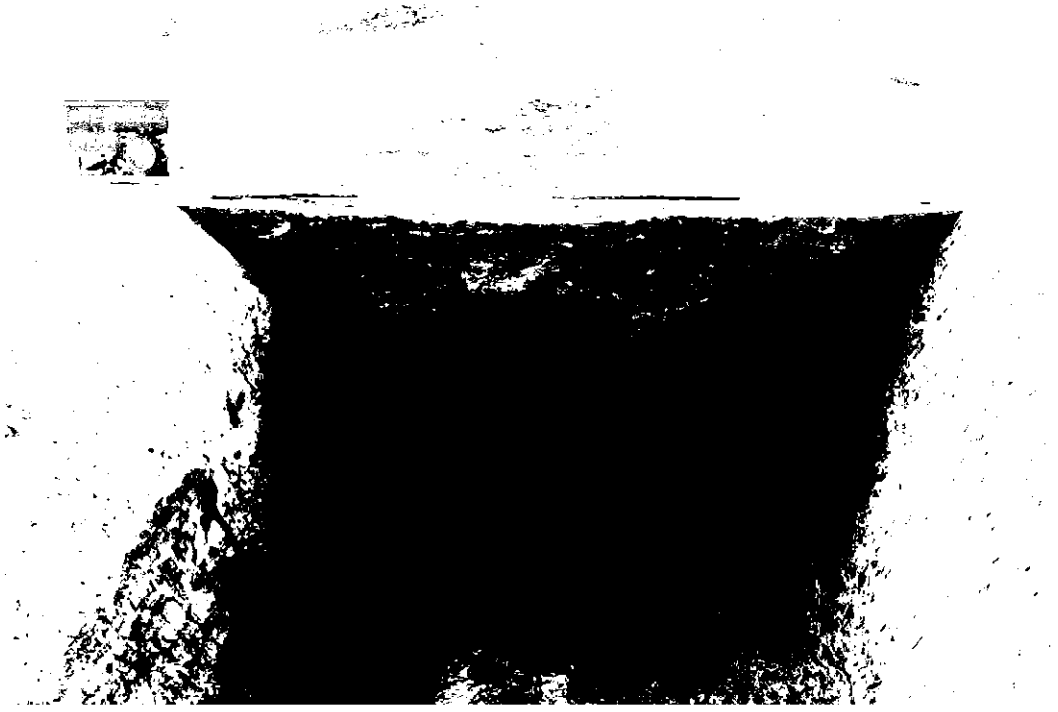


Plate 24: NW facing section of ditch [010]

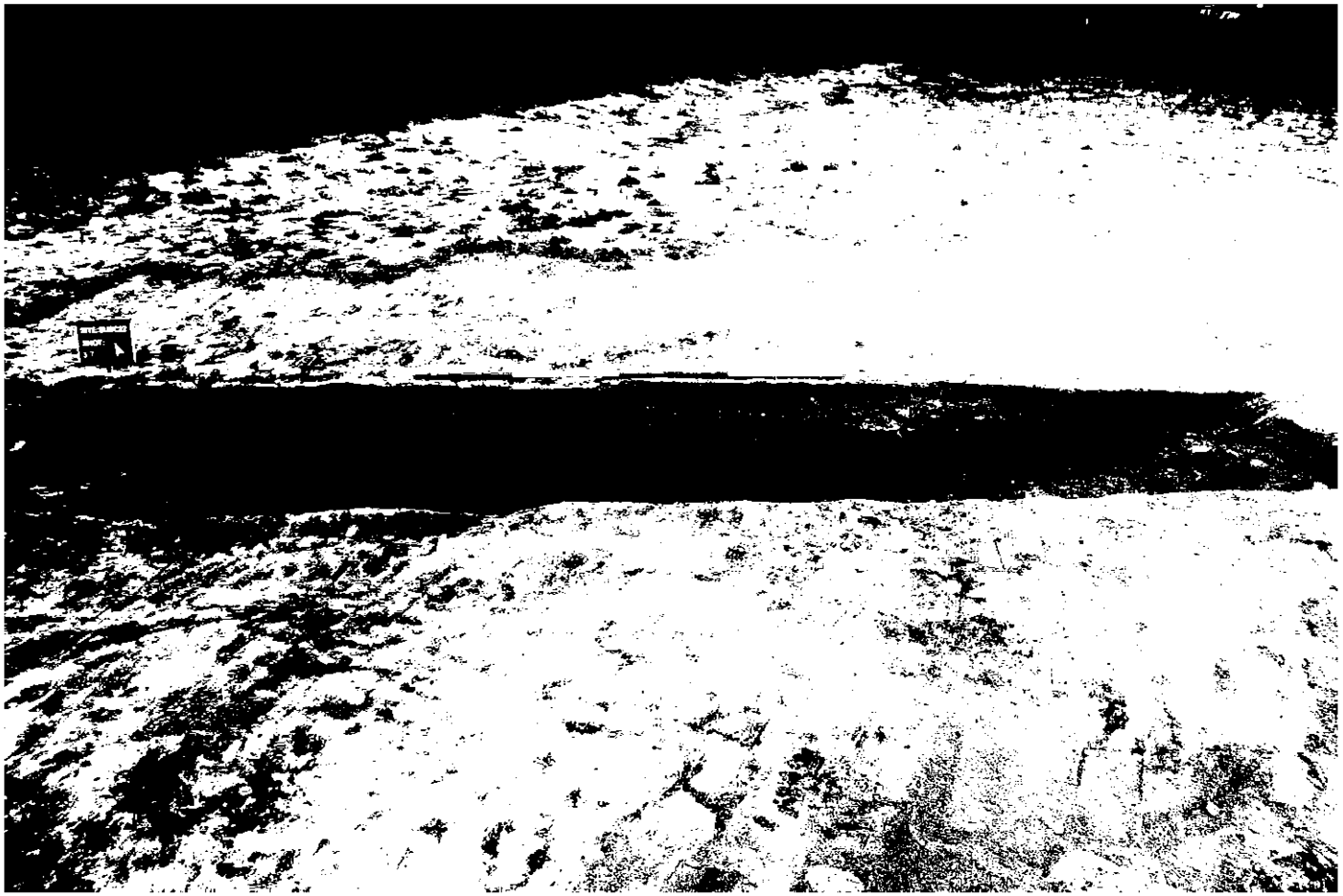


Plate 25: SW facing section of ditch [142]



Plate 26: Post-excavation shots of the site

Appendix 1

CONTEXT DESCRIPTIONS

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(001)	Topsoil	Hard, dark brownish-grey sandy-silt with occ. small flecks of charcoal, occ. small fragments of burnt silt, occ. small shell fragments and occ. small angular stones.	Full area.	Full area.	0.52m
(002)	Subsoil	Compact, yellowish mid-brown sandy-silt with occ. small angular stones and occ. small fragments of shells.	Full area.	Full area.	0.10m
(003)	Natural	Compact, rusty yellowish-brown sandy-clay.	Full area.	Full area.	N/A
(004)	Deliberate backfill	Compact, yellowish-brown sandy-silt backfill of the saltern mound on ground surface with shell and small stones inclusions.	N/A	N/A	N/A
(005)	Fill of pit [006]	Firm, brownish mid-grey sandy-silt with occ. burnt, small silt and occ. small charcoal flecks	1.13m	0.90m	0.07m
[006]	Cut of pit	Circular cut with gradually sloping sides, gradual break of slope at the top and base, and uneven base. Truncated by a pit [092].	1.13m	0.90m	0.07m
(007)	Fill of pit [008]	Soft, greyish-brown sandy-silt with moderate, medium size, burnt, hardened silt blocks and occ. small flecks of charcoal.	Diameter 2.32m	-	0.44m
[008]	Cut of pit	Circular cut of a pit with moderately sloping sides, sharp break of slope at the top and gentle at the base. The base is concave.	Diameter 2.32m		0.44m
(009)	Fill of ditch [010]	Friable, mixed greyish-brown sandy-silt with moderate burnt clay fragments and occasional small flecks of charcoal.	>1m	0.75m	0.16m
[010]	Cut of ditch	Linear cut of a ditch with gently sloping sides, sharp break of slope at the top and gentle at the base. The base is concave. Aligned to NE-SW.	>1m	0.75m	0.16m
(011)	Fill of a pit [012]	Friable, dark greyish-brown silty-sand with large, occasional, solidified organic silt blocks, occasional medium and small burnt clay blocks and fragments, moderate, small charcoal flecks	>0.32m	0.50m	0.18m
[012]	Cut of a pit	Oval shape cut of a waste pit with steep sides and concave base. The break of slope is sharp at the top and gentle at the base. Aligned to NE-SW.	>0.32m	0.50m	0.18m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(013)	Deliberate backfill	Compact, light yellowish-brown sandy-silt with occasional small burnt silt blocks.	>2.00m	>2.01m	0.33m
(014)	Deliberate backfill	Compact, greyish mid-brown sandy-silt with occasional small flecks of charcoal and occasional small burnt silt.	>2.00m	>1.62m	0.48m
(015)	Deliberate backfill	Compact, yellowish-brown sandy-silt with occasional burnt clay fragments.	>2.00m	>1.20m	0.40m
(016)	Fill of a ditch [017]	Compact, yellowish mid-brown sandy-silt with moderate small fragments of shells	>1.00m	1.56m	0.24m
[017]	Cut of ditch	Linear ditch with steep sides, undulate base, sharp break of slope at the top, gentle at the base at its southern and sharp on its northern side. It is aligned to NE-SW.	>1m	1.56m	0.24m
(018)	Fill of a ditch [019]	Compact, yellowish-mid-brown sandy-silt with occasional small flecks of charcoal.	>1.46m	0.50m	0.11m
[019]	Cut of a ditch	Linear cut of a ditch with steep sides and flat base. Its brake of slope is sharp at the top and at the base.	>1.46m	0.50m	0.11m
(020)	Fill of a ditch [021]	Compact, yellowish-brown sandy-silt with occasional small fragments of shells.	>1.00m	>1.40m	>0.20m
[021]	Cut of a ditch	Linear cut of a ditch with steep sides, concave base, sharp break of slope at the top and gentle at its base. Aligned to NE-SW.	>1.00m	>1.40m	>0.20m
(022)	Fill of ditch [023]	Compact, yellowish-brown sandy-silt deliberate backfill with occasional small fragments of shells.	n/a	>0.10m	n/a
[023]	Cut of a ditch	Linear cut of a ditch with steep sides, flat base and sharp brake of slopes. Aligned to NE-SW. Truncated by a linear ditch [017]	n/a	>0.10m	n/a
(024)	Fill of a pit [025]	Firm, mid-brown sandy-silt without noticeable inclusions.	1.28m	1.25m	0.15m
[025]	Cut of a pit	Irregular shape pit with steep sides, concave base and gradual breaks of slope.	1.28m	1.25m	0.27m
(026)	Silt waste backfill	Firm, mid-yellowish-brown sandy-silt with occasional small flecks of charcoal and small burnt silt blocks.	>1.5m	2.28m	0.26m
(027)	Silt waste backfill	Firm, greyish-brown sandy-silt with occasional small flecks of charcoal and small, burnt silt blocks.	>1.00m	0.87m	0.11m
(028)	Organic silt backfill	Firm, brown silt with occasional, small charcoal flecks.	>1.00m	2.04m	0.06m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(029)	Backfill of fuel ash	Firm, mid-grey ashy-silt with occasional burnt silt inclusion.	>1.00m	1.44m	0.05m
(030)	Silt waste backfill	Firm, light brown sandy-silt with occasional small flecks of charcoal and small burnt silt blocks.	>1.0m	2.98m	0.32m
(031)	Silt waste backfill	Firm, light brown sandy-silt backfill with occasional small flecks of charcoal and small burnt silt blocks.	>1.0m	6.34m	0.58m
(032)	Silt waste backfill	Firm, light brown sandy-silt with occasional small burnt silt blocks.	>0.50m	0.77m	0.07m
(033)	Organic silt backfill	Firm, mid-grey organic, mineralised silt wit occasional small inclusions of burnt silt blocks.	>1.00m	4.88m	0.26m
(034)	Burnt silt backfill	Firm, brownish-red sandy-silt with occasional small burnt silt blocks.	>0.50m	1.39m	0.17m
(035)	Organic silt backfill	Firm, mid-brown sandy-silt backfill with occasional small flecks of charcoal.	>1.00m	2.44m	0.27m
(036)	Burnt silt backfill	Firm, brownish-red, burnt sandy-silt.	>1.00m	1.79m	0.17m
(037)	Organic mineralised silt backfill	Firm, light-grey sandy-silt backfill with occasional small flecks of charcoal.	>1.00m	2.53m	0.16m
(038)	Silt waste backfill	Firm, light brown sandy-silt backfill with occasional small flecks of charcoal and small blocks of burnt silt.	>1.00m	2.72m	0.22m
(039)	Organic silt backfill	Firm, mid-brown silt backfill, burnt in places.	>1.00m	2.52m	0.43m
(040)	Deliberate backfill of spoil	Firm, mid-orangish-blue sandy-clay without inclusion.	>1.50m	2.58m	0.11m
(041)	Silt waste backfill	Compact, light-brown sandy-silt backfill with occasional small flecks of charcoal and burnt silt.	>1.50m	2.68m	0.17m
(042)	Silt waste backfill	Firm, light brown sandy-silt backfill with occasional small flecks of charcoal and burnt silt blocks.	>0.50m	0.94m	0.28m
[043]	Terminus of a ditch	Slightly curvilinear ditch with steep sides and flat base. It has sharp brake of slopes. Aligned to SE-NW.	>1.10m	>0.50m	0.35m
(044)	Fill of a ditch [043]	Firm, dark bluish-grey coarse sandy-silt with lumps of baked clay.	1.50m	>0.50m	0.25m
(045)	Fill of a ditch [043]	Firm, yellowish-brown fine sandy-silt with occasional small, rounded lumps of baked clay.	>0.90m	>0.50m	0.15m
[046]	Cut of a ditch	Linear, slightly curvilinear cut of a ditch with steep sides, irregular/flat base, sharp break of slope at its top and gradual at its base. Aligned to SE-NW.	>1.00m	1.00m	0.39m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(047)	Fill of a ditch [046]	Firm to compact dark bluish-grey coarse sand with occasional burnt clay.	>1.00m	0.70m	0.27m
(048)	Fill of a ditch [046]	Firm, light yellowish orange-brown sandy-silt with moderate rounded baked clay, occasional pottery fragments.	>1.00m	0.71m	0.37m
[049]	Terminus of a ditch	Linear, slightly curvilinear cut of a ditch with moderately steep sides, flat base, sharp and gradual brake of slope at the top and sharp at the base. Aligned to SE-NW.	>2.70m	>0.50m	0.50m
(050)	Fill of a ditch [049]	Friable, mid-dark greyish-yellowish-brown coarse sandy-silt with fired clay lumps.	>2.20m	>0.50m	0.30m
(052)	Fill of a ditch [049]	Firm, light-yellowish-brown sandy-silt with occasional small lumps of fired clay, and frequent lumps of greyish clay.	2.71m	>0.5m	0.30m
[053]	Cut of a ditch	Linear shape cut of a ditch with vertical and steep sides, undulating base and sharp brake of slopes.	>1.00m	>1.00m	1.40m
(054)	Fill of a ditch [053]	Firm, light-yellowish-brown sandy-silt.	>3.85m	>1.00m	0.77m
(055)	Fill of a ditch [053]	Compact, mid-greyish-brown sandy-silt.	>4.30m	>1.00m	0.46m
(056)	Fill of a ditch [053]	Compact, dark-greyish-brown sandy-silt.	>4.90m	>1.00m	0.51m
[057]	Cut of investigative slot	Irregular shape investigative cut with steep southern and boxed-up northern side, flat base with a slight south slope and sharp breaks of slope. Aligned to E-W.	>1.5m	>9.55m	0.86m
[058]	Cut of investigative slot	Irregular shape investigative cut with vertical sides, flat base and sharp breaks of slope.	9.30m	>1.35m	1.17m
(059)	Silt waste backfill	Firm, light-greyish-brown sandy-silt with occasional small blocks of burnt silt.	2.10m	>1.37m	0.27m
(060)	Silt waste backfill	Firm, mid-greyish-brown sandy-silt with occasional small blocks of burnt silt.	1.77m	>1.33m	0.16m
(061)	Mineralised silt deposit	Compact, mid-grey mineralised organic silt waste with occ. small blocks of burnt silt/clay.	3.57m	>1.24m	0.16m
(062)	Mineralised silt deposit	Compact, mid-grey mineralised organic silt waste with occ. small blocks of burnt silt/clay.	4.35m	>1.28m	0.13m
(063)	Burnt silt waste deposit	Firm, brownish-red silt/burnt silt.	0.49m	>1.00m	0.07m
(064)	Mineralised silt deposit	Compact, mid-brownish-grey mineralised organic silt with occasional burnt clay inclusion.	5.25m	>1.12m	0.15m
(065)	Silt waste backfill	Firm, light-brown sandy-silt with occasional burnt silt inclusion.	1.49m	>1.21m	0.13m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(066)	Deliberate backfill	Firm, brownish-dark grey sandy silt deliberate backfill with frequent small charcoal flecks and moderate small burnt silt/clay chunks.	1.24m	>1.07m	0.10m
(067)	Burnt silt backfill	Firm, mid-brownish-red burnt silt with occasional small charcoal flecks.	0.36m	>1.18m	0.12m
(068)	Mineralised silt deposit	Compact, mid-brownish-grey mineralised organic silt waste with occ. small blocks of burnt silt/clay.	1.52m	>1.15m	0.11m
(069)	Silt waste backfill	Firm, light-brown sandy silt with occasional burnt silt.	7.05m	0.93m	0.33m
(070)	Silt waste backfill	Firm, mid-greyish-brown sandy-silt with occasional burnt silt inclusion.	1.35m	0.96m	0.07m
(071)	Silt waste backfill	Firm, light brown sandy-silt with occasional small charcoal flecks.	4.35m	>0.85m	0.26m
(072)	Silt waste backfill	Firm, mid-greyish-brown sandy-silt with moderate burnt silt/clay inclusion.	1.46m	>1.31m	0.26m
(073)	Silt waste backfill	Compact mid-greyish-brown sandy-silt with occasional burnt silt/clay.	2.16m	>1.23m	0.12m
(074)	Silt waste backfill	Compact, light to mid-grey sandy-silt with occasional burnt silt/clay.	2.58m	>1.12m	0.25m
(075)	Silt waste backfill	Firm, mid-brownish-grey sandy-silt with occasional burnt silt/clay and moderate small charcoal flecks.	5.75m	>1.03m	0.19m
(076)	Silt waste backfill	Firm, mid-greyish-brown sandy-silt with occasional burnt silt.	1.10m	>0.83m	0.03m
(077)	Silt waste backfill	Firm, light-brown sandy-silt with occasional burnt silt/clay.	7.50m	>0.98m	0.31m
(078)	Silt waste backfill	Firm, light-brown sandy-silt with occasional burnt silt/clay.	2.00m	>0.81m	0.11m
(079)	Burnt silt backfill	Firm, mid-brownish-red burnt sandy-silt.	0.91m	0.77m	0.05m
[080]	Cut of a possible hearth	Oval cut of a possible hearth with steep sides, concave base and gradual breaks of slope.	1.50m	>1.00m	0.25m
(081)	Fill of a poss. hearth	Firm, mixed colours of light grey, red and black, burnt sandy-silt with frequent small flecks of charcoal.	1.50m	>1.00m	0.25m
(082)	Silt waste backfill	Firm, light-brown sandy-silt with occasional burnt silt.	3.01m	0.66m	0.13m
(083)	Silt waste backfill	Firm on the top and compact on the way down. Mixed colour of, red, brown, and grey, burnt sandy-silt.	3.67m	>1.28m	0.55m
(084)	Silt waste backfill	Firm, light-brown sandy-silt with occasional burnt silt and charcoal.	4.30m	1.15m	0.49m
(085)	Silt waste backfill	Firm, light-brown sandy-silt with occasional burnt silt/clay.	2.51m	0.87m	0.10m
(086)	Silt waste backfill	Firm, light to mid brown sandy-silt with occasional burnt silt and charcoal.	1.39m	>1.28m	0.33m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
[087]	Cut of pit	Sub-circular cut of a pit with gradual break of slope on the top, undulating base, and moderately steep sides.	1.97m	0.91m	0.63m
(088)	Fill of pit [087]	Compact, light yellowish-brown silty-sand.	1.32m	0.82m	0.31m
(089)	Lower fill of pit [087]	Compact, mid greyish-brown silty-sand.	0.76m	>0.20m	0.12m
(090)	Upper fill of pit [087]	Compact, mid redish-greyish-brown sandy-silt.	0.58m	>0.18m	0.09m
(091)	Fill of pit [092]	Soft, mid brown sandy-silt with occasional burnt silt, occasional small angular stones and small flecks of charcoal.	>0.73m	0.90m	0.20m
[092]	Cut of pit	Linear shape pit with gentle breaks of slope, gentle sloping sides and concave base. It is aligned to E-W. Truncated by two pits [008] and [006].	0.73m	0.90m	0.20m
(093)	Fill of pit [025]	Firm, reddish-brown sandy-silt/ burnt clay/clay mixture with frequent burnt silt/clay and occasional charcoal flecks.	0.64m	0.64m	0.12m
[094]	Cut of pit	Irregular/elongated cut of a pit with gentle breaks of slope, gently sloping sides, and undulating base.	3.30m	1.21m	0.34m
(095)	Fill of pit [094]	Compact, mid reddish-brown sandy-silt.	0.77m	0.75m	0.13m
(096)	Fill of pit [094]	Compact, mid greyish-brown sandy-silt.	1.41m	>0.20m	0.16m
(097)	Fill of pit [094]	Compact, mid greyish-brown silty-sand.	0.83m	>0.20m	0.14m
(098)	Fill of pit [094]	Compact, dark greyish-brown silty-sand.	1.18m	1.15m	0.08m
(099)	Fill of pit [094]	Compact, mid greyish-reddish-brown sandy-silt.	0.66m	0.45m	0.12m
(100)	Fill of pit [101]	Hard, mottled greyish-brown sandy-silt backfill with occasional small patches of burnt silt and small flecks of charcoal.	>2.00m	2.70m	0.45m
[101]	Cut of pit	Oval shape cut of a pit with sharp break of slope at its top, gentle NW and slightly sharp SE break at its base, moderately steep sides, and concave base.	>2.00m	2.70m	0.45m
(102)	Fill of pit [103]	Friable, dark greyish-brown sandy-silt with frequent clam shells, occasional small blocks of burnt silt and frequent charcoal flecks.	0.78m	0.77m	0.35m
[103]	Cut of pit	Circular cut of a pit with sharp breaks of slope, moderately steep sides, and flat base.	0.78m	0.77m	0.35m
(104)	Fill of ditch [108]	Hard, light mottled brown sandy-silt backfill with occasional small burnt silt patches and occasional small charcoal flecks.	0.69m	>2.00m	0.90m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(105)	Fill of ditch [108]	Friable mid to dark grey sandy-silt backfill with frequent charcoal, occasional small patches of burnt silt and small shell fragments.	>1.60m	2.49m	0.20m
(106)	Fill of ditch [108]	Hard, mid brown sandy-silt backfill with moderate small flecks of charcoal.	>1.00m	1.95m	0.35m
(107)	Fill of ditch [108]	Hard, yellowish-light-brown sandy-silt backfill with occasional small flecks of charcoal.	>1.00m	2.87m	0.28m
[108]	Cut of ditch	Linear cut of a ditch with sharp breaks of slope, steep NW and gradual SE sides, and concave base. Aligned to NE-SW.	>2.00m	3.50m	0.83m
(109)	Waste deposit	Hard, yellowish mid-brown sandy-silt backfill with occasional small charcoal flecks, small fragments of clam shells, small patches of burnt silt and mollusc shells.	>4.00m	>4.00m	1.37m
(110)	Fill of pit/well [112]	Hard, greyish mid-brown sandy-silt backfill with occasional small fragments of clam shells, mollusc shells and charcoal flecks.	>2.00m	6.65m	1.25m
(111)	Fill of pit/well [112]	Hard, dark brownish-grey sandy-silt backfill with frequent charcoal and occasional small fragments of mollusc shells.	>1.00m	5.58m	0.70m
[112]	Cut of pit/well	Cut of a pit/well with gentle break of slope at its top, gradual NW and steep SE sides. No base was recorded as the feature was not fully excavated due to its depth.	>1.00m	6.65m	>1.70m
(113)	Fill of pit [115]	Compact whitish-light grey mineralised sandy-silt backfill with occasional small patches of burnt silt and small fragments of molluscs' shells.	>2.00m	6.70m	0.38m
(114)	Fill of pit [115]	Hard, greyish mid-brown sandy-silt backfill with moderate mid-size patches of burnt silt, occasional mid-size mineralised silt blocks and small charcoal flecks.	>1.00m	5.38m	0.82m
[115]	Cut of pit	Irregular shape cut of a pit with sharp breaks of slope, steep sides, and undulate base, aligned to E-W.	>1.00m	6.70m	0.93m
(116)	Waste deposit	Hard greyish-brown sandy-silt backfill with moderate small fragments of mollusc shells and small charcoal flecks.	>1.60m	>10.00m	1.18m
(117)	Waste deposit	Hard, yellowish-orangish-brown sandy-silt backfill with occasional small fragments of clam shells.	>1.60m	>12.60	1.10m
(118)	Waste deposit	Hard, greyish-brown sandy-silt backfill with moderate small fragments of mollusc and clam shells and moderate small charcoal flecks.	>1.60m	7.78m	0.68m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(119)	Waste deposit	Hard, yellowish-orangish-brown sandy-silt backfill with occasional small fragments of clam shells and small fragments of mollusc shells.	>6.00m	>2.50m	1.40m
(120)	Waste deposit	Hard, yellowish-orangish-brown sandy-silt backfill with occasional small fragments of clam shells and small flecks of charcoal.	>1.60m	21.30m	1.57m
(121)	Waste deposit	Hard, yellowish-orangish-brown sandy-silt backfill with occasional small fragments of clam and mollusc shells and occasional small flecks of charcoal.	>1.60m	1.80m	0.38m
(122)	Fill of pit [124]	Hard, mottled light-brown sandy-silt with occasional small flecks of charcoal.	>1.00m	1.58m	0.55m
(123)	Fill of pit [124]	Compact, brownish-mid-grey sandy-clay backfill with occasional small fragments of clam or mollusc shells.	>1.00m	1.45m	0.19m
[124]	Cut of pit	Circular cut of a pit with sharp breaks of slope, steep sides and concave base.	0.86m	0.84m	0.63m
(125)	Fill of pit [126]	Hard, yellowish-light-brown sandy-silt with occasional small clay patches and medium size charcoal flecks.	0.33m	0.32m	0.38m
[126]	Cut of pit	Circular cut of a pit with sharp breaks of slope, steep NE and nearly vertical SW sides and concave base.	0.33m	0.32m	0.38m
(127)	Fill of terminus [128]	Firm, mid-greyish-brown sandy-silt with moderate inclusions of burnt silt.	>1.47m	0.81m	0.17m
[128]	Cut of terminus	Linear cut of a ditch terminus with gradual breaks of slope, moderately steep sides and concave base.	>1.47m	0.81m	0.17m
(129)	Fill of ditch [130]	Firm, mid-greyish-brown sandy-silt with moderate inclusion of burnt silt and occasional small flecks of charcoal.	>0.20m	1.16m	0.23m
[130]	Cut of ditch	Linear cut of a ditch with gradual breaks of slope, steep sides and concave, nearly "V" shape base. Aligned to E-W.	>0.20m	1.47m	0.55m
(131)	Fill of ditch [130]	Firm, nearly compact mid-grey sandy-mineralised silt.	>0.20m	1.17m	0.14m
(132)	Fill of ditch [130]	Firm mid-greyish-brown sandy-silt with occasional inclusion of burnt silt and charcoal.	>0.20m	1.09m	0.29m
[133]	Cut of irregular pit	Irregular shape cut of a pit with gradual break of slope at its top and gentle break at its base, gently sloping sides and undulating sides.	2.05m	1.40m	0.26m

Context	Interpretation	Description	Length (m)	Width (m)	Depth/thickness (m)
(134)	Top fill of pit [133]	Compact, dark reddish-greyish-brown sandy-silt.	>0.60m	0.69m	0.55m
(135)	Bottom fill of pit [133]	Compact, light yellowish-brown sandy-silt.	2.05m	1.40m	0.16m
[136]	Cut of irregular pit	Irregular shape cut of a pit with gentle breaks of slope, gradual sides and undulate, nearly flat base.	1.53m	0.74m	0.15m
(137)	Fill of pit [136]	Compact, mid-yellowish-brown sandy-silt.	1.53m	0.74m	0.15m
[138]	Cut of irregular pit	Irregular shape cut of a pit with sharp breaks of slope, steep sides and undulate/concave base.	1.53m	1.19m	0.34m
(139)	Fill of pit [138]	Compact, mid-yellowish-brown sandy-silt.	1.53m	1.19m	0.34m
[140]	Cut of terminus	Cut of a terminus of a ditch with gentle breaks of slope, gradually sloping side and undulate base. Aligned to N-S.	>1.00m	>1.04m	0.29m
(141)	Fill of terminus [140]	Compact, mid/dark greyish-brown sandy-silt.	>1.00m	>1.04m	0.29m
[142]	Cut of ditch	Linear shape cut of a ditch with gentle breaks of slope, steep sides and slightly undulating/flat base. Aligned to E-W.	>6.00m	1.20m	0.73m
(143)	Fill of pit [146]	Compact, mottled yellowish-brown sandy-silt with occasional small flecks of charcoal.	>1.80m	>2.00m	0.33m
(144)	Fill of pit [146]	Compact, mixed colours of dark-grey, yellow, orange and brown sandy-silt with occasional small fragments of clam shells, small patches of burnt silt and moderate small flecks of charcoal.	>8.43m	>2.80m	0.48m
(145)	Fill of pit [146]	Compact, yellowish-brown sandy-silt with occasional small charcoal flecks.	2.73m	>1.50m	0.15m
[146]	Cut of pit	Irregular shape cut of a pit with sharp brake of slope at its eastern top and vertical/sharp at its western top, gentle break at its base at its eastern and sharp at its western side. It has steep eastern and vertical western side and undulate base. Aligned to E-W.	9.16m	2.80m	0.50m
(147)	Fill of ditch [142]	Compact, mid-yellowish-brown sandy-silt.	>1.00m	2.60m	0.46m
(148)	Void	Void	Void	Void	Void
(149)	Middle fill of ditch [142]	Compact, mid-greyish-brown sandy-silt.	>1.00m	1.18m	0.48m
(150)	Upper fill of ditch [142]	Compact, mid-yellowish-brown sandy-silt.	>1.00m	3.10m	0.43m
(151)	Lower fill of ditch [142]	Compact, mid-greyish-yellowish-brown sandy-silt.	>1.00m	1.59m	0.26m
(152)	Bottom fill of ditch [142]	Compact, dark greyish-brown sandy-silt.	>1.00m	1.68m	0.06m

Appendix 2

FINDS

POST ROMAN POTTERY

By Jane Young

Introduction

Three hundred and thirty-four sherds of post-Roman pottery, representing two hundred and six vessels and weighing 4.585kgs were examined for this report. The chronologically identifiable pottery ranges in date from the Late Saxon to post-medieval periods.

The assemblage is very mixed comprising at least sixty-two fabrics grouped into thirty-six ware types including four newly defined ones. The pottery was mainly in poor condition with much of the fossil shell temper being leached from the edges (and some surfaces) of sherds and a high proportion of vessels (132 in total) having sufficient concretions over both surfaces and breaks to render visual identification impossible. The entire assemblage therefore was examined under a x20 binocular microscope using a small freshly broken edge. Every effort was made (a check with each sherd against all others in that fabric) to check for cross-deposit joins but none were found.

The fabric codenames (CNAME) of the City of Lincoln Archaeology Unit (Young et al 2005) expanded for use within the County were used for recording together with four newly defined ware types (Table 1). The assemblage was quantified by four measures: number of sherds, vessel count, weight in grams and Estimated Rim Equivalent (REVE) with the resulting archive being entered onto an Access database (Appendix 1). Recording of the assemblage was in accordance with the guidelines laid out in Slowikowski, *et al.* (2001) and a Standard for Pottery Studies in Archaeology (2016) and complies with the Lincolnshire County Council's *Archaeological Handbook* (sections 13.4 and 13.5).

Condition

The material is mainly in a slightly abraded and stable condition, although some sherds (noted in the archive) are laminating. Individual sherd size as presented varies from 1gram to 98 grams, however nine sherds have freshly broken edges with no recovered joining sherds indicating that on deposition they were of larger size. Forty-two vessels are represented by more than a single sherd. One hundred and thirty-two vessels are covered in concretions consistent with having been deposited in a waterlain environment.

The Pottery

In total three hundred and thirty-four sherds from two hundred and six vessels of Late Saxon to post-medieval type were presented for examination. The thirty-six recovered ware types are mainly from local and regional sources, but one continentally imported sherd was recovered (Table 1). These include five fabrics grouped into four newly defined ware types. The recovered vessel form types are mainly limited to a range of jugs pitchers, jars and bowls/dishes, although a footed cooking pot or pipkin and a cup also occur.

Table 1 *Pottery types from the site with total quantities by sherd count, vessel count, weight in grams and Estimated Rim Equivalent (REVE)*

Codename	Full name	Earliest date	Latest date	Total sherds	Total vessels	Total weight	REVE
BAEMWTS	Bourne Area Early Medieval Wheel-thrown Shelly	1100	1200	45	11	530	0.77
BAMWTO	Bourne Area Medieval Wheel-thrown Oolitic	1180	1350	1	1	53	0
BAMWTS	Bourne Area Medieval Wheel-thrown Shelly	1180	1350	18	8	399	0.33
BASS	Bourne Area Sparsely-shelled ware	1200	1450	5	3	131	0.37

BERTH	Brown glazed earthenware	1550	1800	5	2	234	0.07
BL	Black-glazed wares	1550	1750	1	1	6	0
BOSTTT	Boston Glazed ware - Toynton type	1230	1330	4	3	53	0
BOU	Late Medieval to Early post-medieval Bourne ware (Bourne D)	1350	1650	3	3	24	0.10
BOUA	Bourne-type medieval Fabrics A to G	1150	1400	33	28	508	0.46
CIST	Cistercian-type ware	1480	1650	1	1	4	0
DNEOT	Developed St Neots ware	1150	1250	1	1	8	9
DST	Developed Stamford ware	1150	1230	26	6	344	0
DUTR	Dutch Red Earthenware	1250	1650	1	1	34	0
ELMAS	East Lincolnshire Medieval Abundant Shelly	1180	1300	1	1	18	0
EMHM	Early Medieval Handmade ware	1100	1250	34	20	340	0.24
EST	Early Stamford ware	870	1010	1	1	6	0
GRE	Glazed Red Earthenware	1500	1650	3	3	13	0
LSW2	13th to 14th century Lincoln Glazed Ware	1200	1320	2	2	19	4
MEDX	Non Local Medieval Fabrics	1150	1450	7	4	79	0
NDST	Nottingham Developed Stamford-type	1180	1220	1	1	1	0
NOTGL	Light Bodied Nottingham Green Glazed ware	1220	1320	2	2	21	0
SLBTOX	South Lincolnshire Baston-type Oxidised	1200	1350	6	3	226	0
SLEMO	South Lincolnshire Early Medieval Oolitic	1100	1220	1	1	25	0
SLEMS	South Lincolnshire Early Medieval Shelly	1150	1230	4	4	26	0
SLIP	Unidentified slipware	1650	1750	3	3	48	0.15
SLSHCW	South Lincolnshire Shell-tempered Coarseware	1180	1400	1	1	10	0
SLOOL	South Lincolnshire Oolitic (generic)	1050	1500	2	1	22	0
SLQS	South Lincolnshire Quartz and shell (generic)	1180	1500	2	1	10	0
SLSNOL	South Lincolnshire Saxo-Norman Oolitic	1050	1200	5	5	55	0.08
SLSNQCA	South Lincolnshire Saxo-Norman Quartz and Calcareous	1050	1180	9	2	57	0.26
SNEOT	St Neots-type ware	870	1200	2	2	47	0.08
ST	Stamford Ware	970	1200	80	63	771	1.05
STAMT	Stamford-type variants	950	1150	1	1	98	0
STCRUC	Stamford-type Crucible	850	1150	1	1	2	0
TGW	Tin-glazed ware	1640	1770	1	1	29	0
TOY	Toynton Medieval Ware	1250	1450	21	14	334	0.32
Totals				**334**	**206**	**4585**	**17.28**

Late Saxon

A single sherd recovered from recovery group (004) is of late Saxon type. The thickly glazed sherd is from an Early Stamford ware vessel (EST), probably a pitcher, in Fabric A. The vessel is of 10th to early/mid-11th century date.

Saxo-Norman

Ninety-eight sherds representing seventy-four vessels in six ware types, including one newly defined one, are of 11th to 12th century Saxo-Norman type. Few vessels are closely dateable, but the majority are of post-conquest type or date. The majority of sherds (80 sherds from 63 vessels) are from Stamford ware vessels (ST and STCRUC). Stamford ware as discussed by Kilmurray was dived into eight fabrics (Kilmurray 1980), however in reality many sherds fall between these groupings (Table 2). Fabric B is of post-conquest date and Fabric C dates from the mid-12th century, otherwise Fabrics A and G span the period between the 11th and mid-12th centuries thus relying on form, glazing, rim type and manufacture to give closer dating. Table 2 shows the potential for only thirteen vessels to be of pre-conquest date (Fabrics A, A/G and G) but close examination of glazing and form

suggests that at least three of these are of post-conquest type. Most of the sherds come from small unglazed, or glazed, jars or pitchers. Fabrics A/B and B/G are of post-conquest but probable pre-mid-12th century date (8 vessels). These vessels include a collared jar or pitcher with an incised wavy line around the top of the rim (DR 01) in Fabric A/G and a small, spouted pitcher in Fabric B/G. The twenty-six vessels in post-conquest Fabric B mainly comprise a range of glazed and unglazed jars or pitchers with at least four of the vessels being of mid-12th century or earlier collared type. The ten vessels in Fabric B/C including a nice jar (DR 02) are likely to be of mid-12th century date. Six vessels in Fabric C are of mid to late 12th century date. A single near-vitrified sherd with an external fuel ash deposit is from a small hemispherical Stamford ware crucible in Fabric A (STCRUC) of 11th to mid-12th century date. A near-vitrified base from a jug or pitcher is in a fabric similar to that of Stamford Fabric A, but additionally contains common fine black iron-rich grains. The vessel which has spots of glaze externally has been classified as being of Stamford-type (STAMT) of unknown provenance or date.

Table 2 *Stamford ware fabrics arranged by approximate potential date order with vessel count*

Stamford ware Fabric	Vessels
Fabric A	8
Fabric A/G	3
Fabric G	2
Fabric A/B	1
Fabric B/G	7
Fabric B	26
Fabric B/C	10
Fabric C	6
Total	**63**

Five sherds, each representing an individual vessel, are in South Lincolnshire Saxo-Norman Oolitic fabrics (SLSNOL). This mainly reduced type is common in pre- and post-conquest deposits in Stamford and occurs as far north in the county as Lincoln (Young et al 2005). The collared rim of one small jar indicates a post-conquest 11th to mid-12th century date for the vessel. Nine sherds are from two small jars (DR 04 and DR 05) in a newly defined South Lincolnshire Saxo-Norman quartz and calcareous fabric (SLSNQCA).

South Lincolnshire Saxo-Norman Quartz and Chalk (SLSNQC)
The mainly reduced fabric of this wheel-thrown ware may have oxidised external surface patches. The fabric contains abundant rounded quartz of mainly between 0.4mm and 0.8mm size and common mostly rounded calcareous grains of mainly between 0.3mm and 0.6mm but up to 1.0mm. The manufacture and form suggest a mid-11th to mid/late 12th century date.

Two St Neots ware sherds (SNEOT) is from a large shallow sloping bowl or dish and a small jar of probable 11th century date.

Early Medieval

One hundred and seventeen sherds in ten ware groups and representing forty-seven vessels are of early medieval type. The majority of vessels are quartz, fossil shell or calcareous-tempered coarseware but a small number of glazed finewares (7 vessels) do occur. The sherd to vessel ratio is high for this ceramic period suggesting that at least some of the vessels, despite being covered in concretions, have the potential to represent primary discard. Vessels although primarily of Lincolnshire and East Anglian production do include two vessels from other regional sources (NDST and DNEOT).

Forty-five sherds represent eleven coarsely-shell-tempered vessels in two fabrics grouped into a new Bourne Area Early Medieval ware type (BAEMWTS). At least five of the vessels are large sloping shallow bowls or dishes (DR 11, DR 12 and DR 13). Two large jars (DR 15) and a medium-sized jar are identifiable but the other sherds too small to be certain of form and could come from jars or bowls.

Bourne Area Early Medieval Wheel-thrown Shelly ware (BAEMWTS)
The two recovered fabrics of this competently wheel-thrown ware are both fairly low-fired with sherds firing to a reduced core with dull oxidised surfaces. This ware is most likely to date to the 12th century.

- Fabric 1 – This fabric contains common to abundant coarse fossil shell fragments with little else visible. The four recovered vessels include two large shallow bowls or dishes and five sherds from two jars or bowls.

- Fabric 2 – This fabric contains common coarse fossil shell as found in Fabric 1 together with moderate medium-sized shell fragments, common rounded voids (possibly from burnt out or dissolves calcareous grains) and moderate to common rounded quartz grains. The seven recovered vessels in this fabric include three large shallow bowls or dishes and two large jars, of which one (DR 15) has a typical early medieval-type rim.

Five sherds, each representing an individual vessel, are in previously defined Lincolnshire-produced shell-tempered ware groups. The four South Lincolnshire Early Medieval Lincolnshire Shelly ware (SLEMS) sherds are of mid-12th to early/mid-13th century date and come from two small jars and two jars or bowls. A body sherd from a jar or bowl is in an East Lincolnshire Medieval Abundantly Shelly ware fabric (ELMAS) of probable 12th century date. Two flecks from a single South Lincolnshire Quartz and Shell-tempered jar or bowl (SLQS) are probably of similar date. A single regionally imported shell-tempered Developed St Neots ware (DNEOT) sherd is from a small jar of probable 12th century date.

Three oolitic-tempered sherds are from two vessels of probable 12th to early/mid-13th century date in South Lincolnshire Early Medieval Oolitic ware (SLEMO) and the more generic South Lincolnshire Oolitic Shelly ware (SLOOL). The two South Lincolnshire Oolitic Shelly ware sherds are from a small thin-walled handmade jar or bowl whilst the South Lincolnshire Early Medieval Oolitic ware sherd comes from a medium-sized handmade jar that exhibits internal manufacture finger-pressings.

Thirty-four sherds are from twenty Early Medieval Handmade ware (EMHM) vessels. The vessels fall into three fabric groupings the origins of which are most likely to fall within East Anglia or South Lincolnshire. Twenty-one sherds are from thirteen jars or bowls in fabrics consistent with a source in East Anglia. Similar vessels are found throughout the county and as far inland as Nottingham and Doncaster, being mainly found in 12th to early/mid-13th century groups. These vessels include an unusual miniature jar (DR 17). Ten sherds are from four vessels in similar quartz-tempered fabrics that additionally contain moderate to common rounded calcareous grains. These vessels may be of East Anglian or South Lincolnshire production. The third grouping consists of three sherds in Bourne fabric G/E. Two sherds are from jars or bowls, and one is from a large bowl with a finger-pressed rim edge. Previous vessels in Bourne-type fabrics seem to belong to the later part of the 12th century or early 13th century.

Twenty-six sherds are from six Developed Stamford ware vessels (DST) in Fabrics B, B/C and C. All but one of the vessels has a copper-speckled yellow or pale green glaze suggesting that they are early in the sequence. Three of the vessels are small jugs or jars, one is a small jug and one a medium-sized jug or jar. The only sherd with a thick copper-green glaze (in Fabric B) is from a small narrow-necked jug or bottle. The thick copper-rich glaze suggests a date between the mid/late 12th and early 13th centuries. Another sherd with a thick copper-green glaze is from a small jug of Nottingham Developed Stamford ware type (NDST).

Medieval

One hundred sherds representing sixty-nine vessels in twenty-one fabrics and belonging to eleven ware groupings, are of medieval type. It is unlikely that any of the vessels post-date the 14th century and most probable that the majority of vessels are of late 12th to 13th century date. The majority of sherds are from coarseware forms such as jars or bowls in quartz and fossil shell-tempered fabrics.

Thirty-three sherds are from twenty-three vessels in six fabric combinations (Fabrics A, A/B, A/C, B, B/C and C are of Medieval Bourne-type (BOUA). Fabric A contains finer quartz grains than Fabric B and Fabric C is oolitic-tempered. This medieval ware is thought to start in the late 12th century and has probably ceased production by the end of the 14th century. Little work has taken place on well-stratified groups to form a reliable chronological sequence, although it is generally thought that the introduction of Fabric A predates Fabric B, although both seem to be in use together in most recovered groups. The medieval Bourne industry produced both fineware jugs and coarseware forms such as jars and bowls. The eleven vessels in Fabric A include four small jars, one medium-sized jar, a small jug (DR 06) and two bowls. Two of the six vessels in Fabric A/B can be identified as jugs and two of jars. The only sherd in Fabric A/C is from a jar or bowl. Two large bowls (DR 07) and a jar are amongst the four vessels in Fabric B whilst the two sherds in Fabric B/C comprise a small jar and a small jar or bowl. All

three of the Fabric C vessels are jars. The general visual appearance and manufacture of most of the medieval Bourne-type vessels recovered from the site suggest a 13th century date.

Six sherds are from two South Lincolnshire Baston-type Oxidised jugs and a small narrow-necked jug or bottle. The only decorated sherd is from a jug in Fabric 2. This jug has a reduced glaze with curved and vertical applied iron-rich strips, possibly forming a Fleur de Lys motif, in brown. The vessels are of 13th century date.

Four sherds from two small and one medium-sized jugs are of Boston Toynton-type (BOSTT). Wasters of this type have been found in Boston but it is by no means certain that the type is made there. It first appears in fairly well-stratified groups of mid/late 13th century date and continues to be found in Boston groups until possibly as late as the mid-14th century. Two of the jugs have applied vertical iron-rich strip decoration.

Twenty-one sherds are from twelve Medieval Toynton ware jugs and two jugs or jars (TOY). None of the recovered jugs are decorated. Visual appearance, glazing and manufacture suggest that all of the recovered vessels date to between the late 13th and 14th centuries with at least three of the jugs being of pre-mid-14th century date.

Two sherds are from 13th to 14th century Lincoln Glazed ware jugs (LSW2). An in-turned rim on one of the jugs indicates an early to early/mid-13th century date but the other jug is glazed with a thick copper-rich glaze and can only be dated to between the early/mid and late 13th century. Two jug sherds also with copper-rich glazing are from Nottingham Light-bodied Glazed ware jugs (NOTGL) of 13th century date. One of the four unidentified regional medieval imports (MEDX) is an oxidised highly micaceous sherd with an amber glaze. The sherd is from a jug of 13th or 14th century date and is possibly an example of Essex Micaceous ware. Another unidentified regional quartz-tempered sherd is probably from a jar.

The remaining vessels are jars or bowls in various fossil shell or calcareous fabrics. Production sources for none of these types are known, although the inclusions in the fabrics mainly suggest a Bourne Area, or other South Lincolnshire source. Eighteen coarsely shell-tempered sherds are from eight wheel-thrown vessels in a newly defined ware group.

Bourne Area Medieval Wheel-thrown Shelly ware (BAMWTS)

- Fabric 1 - The sherds recovered from this site have been group as Fabric 1 as further examples in the type may have variant inclusions. The ware is highly fired to a reduced core with dull oxidised surfaces. The fabric consists of abundant medium to coarse fossil shell fragments and sparse quartz grains, Six of the eight recovered vessels can be identified as jars of large (DR 18), medium, small and miniature size. One basal sherd appears to come from a large bowl with the other sherd being from a jar or a bowl. The ware most probably dates to between the late 12th and early/mid-14th centuries, but further well-stratified groups are needed to be more specific.

Three sherds, each representing an individual vessel, are of Bourne Area Sparsely-shelled ware (BASS). Two of the sherds come from large jars (DR 09 and DR 10), one of which has finger-pressed decoration around the rim edge (DR 10). The other sherd is from a squat jar with an unusually shaped rim (DR 16). The type is currently dated to between the 13th and mid-15th centuries but almost every example recovered occurs in 13th to mid-14th century groups. A basal sherd from a jar or bowl heavily covered in concretions and partially leached is probably of generic South Lincolnshire Shell-tempered Coarseware type (SLSTCW). The ware is dated to between the late 12th and 14th centuries,

A basal sherd in a reduced oolitic fabric from a large jar has been given a new ware type designation (BAMWTO),

Bourne Area Medieval Wheel-thrown Oolitic ware (BAMWTO)

This high fired, reduced ware has a thin dull oxidised external surface. The abundant inclusions are almost completely masked on the vessel surfaces. The fabric contains abundant rounded calcareous grains most of which appear to be oolite, the type most probably dates to between the late 12th and early/mid-14th centuries.

Five oxidised sherds are from two regionally imported fossil shell-tempered vessels of probable late 12th to 14th century date (MEDX). Two sherds from a jug or jar have bands of square roller-stamping around the shoulder of the vessel. The vessel may be a regional import from the Northamptonshire or Cambridgeshire areas but does not fit any known ware groups. The other sherd is from a small highly fired wheel-thrown jar with the fossil shell being masked on the vessel surfaces.

Late Medieval to Early Post- Medieval

Five sherds, each representing an individual vessel, are of late medieval to early post-medieval type. Three of the sherds from two jugs and a small jug or jar are of Late Medieval to Early Post-medieval Bourne type (BOU). The vessels can only be dated to between the mid-15th and 16th centuries. A small sherd from a Cistercian ware cup (CIST) has a fabric that may suggest a potential Bourne production. The cup is of mid/late 15th to 16th century date. The only continentally imported sherd to be recovered from the site is from a Dutch Red Earthenware (DUTR) footed cooking pot or pipkin of mid-14th to 15th century type.

Post Medieval

Thirteen sherds representing ten vessels are of post-medieval type. Three internally glazed, Glazed Red Earthenware sherds, are from jars or bowls of mid-16th to 17th century date GRE). The five recovered, Brown-glazed Earthenware sherds (BERTH) come from a large bowl of late 17th to 18th century type and a jar of mid-17th to 18th century date. The single, Black-Glazed Earthenware sherd (BL) found is from a small drinking vessel of mid-16th to mid-17th century date. The three Slipware sherds recovered from the site are all in poor condition with little, or no remaining internal glaze. The light-bodied sherds all come from large bowls and have traces of an internal white slip suggesting a yellow-glazed vessel. The bowls potentially date to between the mid-17th and 18th centuries. A single Tin-glazed Earthen ware basal sherd is probably from a small bowl of 17th or 18th century date. There are no traces of internal decoration.

The Site Sequence

The site produced three hundred and thirty-one post-Roman sherds of mixed late Saxon to post-medieval type (Table 3) representing two hundred and three vessels recovered from thirty-two contexts. Of these seventy-seven sherds from fifty-nine vessels were recovered as machine finds (context 004). This is a very mixed assemblage as would be expected for a recovered group. Most of the vessels are of Saxo-Norman to medieval date reflecting the site assemblage as a whole but the only late Saxon sherd to be found was in this group as well as all but one of the late medieval or post-medieval vessels recovered.

Table 3 *Pottery by ceramic period with total quantities by sherd count, vessel count, weight in grams and Estimated Rim Equivalent (REVE)*

Ceramic	Total	Total vessels	Total weight	REVE
Late Saxon	1	1	6	0
Saxo-Norman	96	72	1025	1.47
Early Medieval	116	46	1323	1.10
Medieval	100	69	1833	1.52
Late medieval	5	5	62	0.10
Post-medieval	13	10	330	0.22
Totals	**331**	**203**	**4579**	**4.41**

Seven ditches and two terminals produced small groups of pottery. The largest group came from ditch [053] with forty-five sherds representing twenty-five vessels being recovered from two fills (deposits (054 and 055). The groups from both fills are mixed containing pottery of Saxo-Norman to medieval type. The latest closely dateable sherds are from Medieval Toynton ware jugs of late 13th to 14th century date. Almost every sherd is covered in concretions and all but two vessels are represented by a single sherd.
Two fills (deposits 129 and 132) of ditch [130] produced a total of three sherds, each representing an individual vessel of Saxo-Norman type. The presence of a Stamford ware jar in Fabric B indicates a post-conquest date for deposition. The latest of the three sherds recovered from fill (016) of ditch [017] is the rim of a large, Brown-glazed Earthenware bowl of late 17th to 18th century date. Fill (048) of ditch [046] produced ten sherds from three vessels of Saxo-Norman type. The presence of two Stamford ware vessels in Fabric B indicates a post-conquest date for deposition. A single sherd from a small post-conquest Stamford ware jar in Fabric B was recovered from fill (104) of ditch [108]. The two Stamford ware sherds recovered from fill (147) of ditch [142] are of mid to late 12th century type.

Terminus [128] (fill 127) produced two sherds from Early Medieval Handmade jars or bowls of East Anglian type. Similar vessels usually appear in groups of late 11th to early/mid-13th century date in South Lincolnshire. A

single sherd recovered from fill (141) of terminus [140] is from a Stamford ware jar or pitcher in Fabric B of post-conquest 11th to 12th century date.

Pit [146] (fill 144) contained two sherds from Stamford ware vessels in Fabrics A and A/G. These vessels have the potential to be of pre-conquest 11th century date and certainly date to no later than the mid-12th century. Seven thin flecks from a single Bourne Area Early Medieval Wheel-thrown Shelly ware jar or bowl of probable 12th century date were recovered from lower fill (089) of pit [087]. Two fills (deposits 110 and 111) of pit or well [112] produced a total of seven sherds of pottery, each representing an individual vessel. The group is mixed with the latest sherd coming from a decorated Boston Toynton-type jug of potential mid/late 13th to mid-14th century date.

Deposit (013) produced sixteen sherds from nine Stamford ware vessels in mixed fabrics. The chronologically latest fabric (Fabric C) does not appear in groups pre-dating the mid-12th century. The three vessels in Fabric A, the jar or pitcher in Fabric A/B and the small jar or bowl in Fabric B/G are unlikely to post-date the mid-12th century. If this small group is contemporary it dates to the mid-12th century otherwise the small Fabric C jar has a potential mid to late 12th century date.

A group of forty-two sherds representing thirteen vessels was recovered from deposit (014). The group is mixed although most vessels are likely to be of 12th to early/mid-13th century date. The latest vessels in the group are probably the five Bourne Area Early Medieval Wheel-thrown Shelly ware jars and bowls and the squat Bourne Area Sparsely Shelled ware jar. These vessels are most likely to date to between the mid/late 12th and early/mid-13th centuries and may represent primary or redeposited primary, deposition.

Deposit (031) produced three sherds from a small Stamford ware pitcher of pre-conquest 11th to mid-12th century date and two sherds from a large Bourne Area Early Medieval Wheel-thrown Shelly ware shallow bowl or dish similar to those found in deposit (014).

The two sherds found in deposit (037) are of Saxo-Norman type and come from a small Stamford ware pitcher in Fabric B/G and a South Lincolnshire Saxo-Norman Oolitic ware jar or bowl. The pitcher is of post-conquest 11th to mid-12th century date whilst the jar or bowl can only be dated to between the 11th and 12th centuries.

A single handle sherd recovered from deposit (038) is from a jug or pitcher in Stamford ware Fabric B. The vessel is of post-conquest 11th to 12th century date.

Deposit (039) produced a small group of thirty sherds representing seventeen vessels of mixed early medieval and medieval type. If the group is contemporary it belongs to the period between the late 12th and early/mid-13th centuries otherwise as individual sherds the latest vessels have the potential to date into the 14th century.

Twenty-two sherds representing fifteen vessels of mixed Saxo-Norman to medieval type were recovered from deposit (041). The latest vessels are most likely to date to between the late 12th and mid-13th centuries.

Silt deposit (069) produced three sherds of Saxo-Norman type. The two Stamford ware vessels in Fabric C indicate a post-mid-12th century date, but the jar or bowl in East Lincolnshire Abundantly Shelled ware could extend into the 13th century.

Eight sherds of Saxo-Norman type and an early medieval sherd representing eight vessels in total were recovered from silt deposit (075). Eight of the vessels are Stamford ware jars, pitchers and one sherd are from a small Developed St Neots ware jar. If these vessels are contemporary, they belong to the mid-12th century otherwise the latest Stamford ware vessels have the potential to date up to the late 12th century and the St Neots ware jar into the 13th century.

Silt deposit (077) produced four sherds of mixed Saxo-Norman and medieval type, each representing an individual vessel. The latest vessel is probably a small Medieval Toynton ware jug of late 13th to 14th century type.

The seven sherds recovered from silt deposit (082) come from two Stamford ware vessels. A sherd from a small jar or bowl dates to no later than the mid-12th century whilst the jar in Fabric B/C represented by six sherds is highly unlikely to predate the mid-12th century. If the two vessels are contemporary, they belong to the mid-12th century otherwise the Fabric B/C jar could date to as late as the end of the 12th century.

Silt deposit (084) produced fourteen sherds from five vessels of mixed Saxo-Norman to medieval type. The latest sherd is from a Medieval Toynton ware jug of late 13th to 14th century type.

A single tiny sherd from a small South Lincolnshire Saxo-Norman Oolitic-tempered jar of potential 11th to mid-12th century date was recovered from fill (098) of pit (094) during sampling.

Four sherds, each representing an individual vessel of medieval type, were recovered from waste deposit (109). Two sherds from a small jar and a bowl are of 13th to 14th century Medieval Bourne type. A copper-glazed Lincoln 13th to 14th century Glazed ware jug is of early/mid to late 13th century date whilst the small Medieval Toynton ware jug is of late 13th to 14th century type. If this small group is contemporary it belongs to the period between the late 13th and early/mid-14th centuries.

Waste deposit (116) produced eleven sherds from six vessels of medieval date. The small group includes vessels of Baston (SLBTOX), Bourne (BOUA), Lincoln (LSW2) and Toynton types (BOSTTT and TOY). The small group is not entirely contemporary as the Lincoln ware jug (LSW2) dates to between the early and early/mid-13th century whilst the Toynton ware jugs (TOY) are of late 13th to 14th century type.

Two sherds were recovered from waste deposit (118). One sherd is from a small Early Medieval Handmade ware jar or bowl in Bourne Fabric G/E, and one is from a large 13th to 14th century Medieval Bourne ware bowl in Fabric B.

Waste deposit (119) produced a single sherd from a Boston Toynton-type jug of mid/late 13th to mid-14th century date.

Summary and Recommendations

This assemblage is extremely diverse encompassing more than sixty-two fabrics grouped into thirty-six ware types of late Saxon to post-medieval date. The nature of deposition and lack of availability of a detailed site report for the assessment of this assemblage renders detailed discussion of individual chronological phases of activity on the site impossible. The recovered material however does suggest that most of the activity in the vicinity of the site took place between the mid-12th and mid-14th centuries. The pottery suggests that although most vessels in use in the local area were supplied by fairly local production centres such as Baston, Bourne and Stamford, regional imports from Cambridgeshire, East Anglia (most probably Norfolk), Lincoln and Nottingham were readily available.

Thirteen sherds have been removed to the County Fabric Type Series otherwise this important assemblage should be retained for future study. Eighteen vessels are suitable for future illustration of potential post-conquest to 13th century types to be found in the local area.

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CERAMIC BUILDING MATERIAL
By Jane Young

Introduction

Twenty-seven fragments of ceramic building material comprising handmade structural brick, hand-formed brick or slab, pantile and fired clay, weighing 4.071kgs in total, were submitted for examination. The chronologically identifiable material is of late medieval to early modern date.

The fragments were examined at x 20 binocular magnification using a binocular microscope. The fired clay, handmade and hand-formed bricks were divided into five site-based fabrics based on microscopic examination. Descriptions of these site-based fabrics based on x20 binocular magnification are given below. The assemblage was recorded using ceramic codenames (Table 4) and the resulting archive was entered in an Access database (Appendix 1). Recording complies with the guidelines laid out in Slowikowski, *et al.* (2001), the Archaeological Ceramic Building Materials Group guidelines (2001) and the Lincolnshire County Council's *Archaeological Handbook* (sections 13.4 and 13.5).

Condition

The material recovered is mainly in a very abraded to abraded condition. The hand-formed bricks are in poor and friable condition and will need careful packaging for deposition in a museum store, Individual fragment size ranges from 1 gram to 603grams.

The Ceramic Building Material

A limited range of ceramic building material, mainly late medieval to post-medieval handmade brick, or hand-formed brick or slab associated with salt making was examined. The assemblage also includes a limited amount of fired clay and two early modern pantile.

Table 4: *Ceramic building material codenames and total quantities by fragment count and weight in grams*

Codename	full name	Total fragments	Total weight
BRK	Brick	9	2100
FIRED CLAY	fired clay	4	195
HFBRK	Hand-formed brick	12	1690
PANT	Pantile	2	86
Totals		**27**	**4071**

The Late Medieval to Late Post-medieval Brick

Nine fragments of handmade brick from seven bricks in two site-based fabrics were presented for examination. The bricks are of late medieval to early post-medieval type with six of the examples from the site being recovered from deposits that produced also pottery of late 13th to early/mid, mid or late 14th century date. Two brick types were identified in the assemblage, each being in similar almost inclusion-free micaceous fabrics (Site Fabrics 1 and 2).

- Site Brick Type 1

The six bricks of this type are in site-based Fabric 1. This oxidised fabric ranges in hue from orange through orange-red to red with the fabric becoming redder the higher fired the brick. There is some cream marbling to a

few pieces. The micaceous fabric is almost inclusion-free but has occasional clay pellets up to 5mm in size and variable patches of fine rounded calcareous grains and round to subround quartz grains. Abundant fine round to subround quartz grains are used for the bedding and moulding sand. The recovered fragments suggest that these bricks have been produced using a mould dipped diagonally into sand after dipping into water thus giving two adjoining sides (an end and a stretcher) that are sand-moulded and two that are slop-moulded. No complete measurements are available, but the single width recovered is 130mm and the thickness varies between 58mm and 60mm. The upper surface of the brick may be slightly sunken, and one example has a sunken end margin. The surfaces of the bricks are variably vegetal marked, probably due to stacking during drying on grass when still sufficient wet to cause an impression.

- Site Brick Type 2

A single fragment in site-based Fabric 2 represents this brick type. The brick is fairly highly fired to a red hue and has yellow salt-surfacing to the upper surface. The fabric is similar to that of Fabric 1 but contains more common calcareous grains and sparse to moderate very variable iron-rich grains. The bedding consists of common fine calcareous inclusions and abundant round to sub-round quartz grains of mainly 0.3mm to 0.4mm size. The recovered fragment has evidence for slop-moulding, however as only part of one side was recovered this brick type as with Type 1 may have been manufactured using the part slop-moulding and part sand-moulding method, The recovered brick is 60mm thick and has a stacking scar on the side.

The Pantile

Two fragments of early modern pantile in a fine red sandy fabric were recovered. The tiles are of late 19th to 20th century type.

The Hand – formed Brick or Slab

Twelve fragments in a very poor condition appear to be from nine non-structural hand-formed bricks or slabs and an uncertain but probably similar adapted form. None of the recovered pieces are complete in thickness but the larger fragments where measurable vary between 53 and 78mm in size. Several edge flecks with two unevenly flattened surfaces and one corner piece with three surfaces each at roughly 90 degrees are present in the group. One of the fragments in Site Fabric 3 has been adapted before firing with a purposely shaped arch cut into one side. The purpose of this object is unclear, but it may have been designed to fit around a rounded object. It is most probable that these bricks or slabs were associated with salt-making, however only two pieces have sufficient remaining of the original surfaces to detect any of the yellow salt-blushing typically associated with this activity.

- Site Fabric 3

The fragments in this fabric are of a dull orange to orange-brown hue. The micaceous fabric contains few inclusions other than the fine compact quartz sand of below 0.1mm that forms the basis of the fabric, although common rounded organic voids of between 0.3mm and 1.0mm are readily visible by eye. These voids give the impressions of being formed by decayed roots possibly suggesting that the 'clay' was merely used as dug.

- Site Fabric 5

A single very abraded lump with a small patch of original flattened surface is in a fabric similar to that of Fabric 3 but also containing abundant iron-rich inclusions and patches of pre-dried or fired clay.

The Fired Clay

Four pieces of fired clay from two objects were recovered from the site. Three fragments in a fairly fresh condition form a thin hand-pressed wodge of clay. The wodge is in Fabric 3 and varies in thickness from 3.0mm to 35.0mm. There are multiple finger and thumb-pressings on both the upper and lower surfaces formed by the squeezing of a clay lump into a suitable shape for use. It is probable that these wedges were deliberately manufactured for a specific one-off use to stabilise various components associated with salt production. An abraded 30mm thick flake in Site Fabric 4 is difficult to interpret. The flake has an upper flattened surface into which a diagonal rounded profiled groove pointing downwards has been impressed before firing.

- Site Fabric 4

A single abraded flake in this fabric is fired to a red hue. The calcareous fabric contains abundant fine calcareous grains of mainly below 0.1mm size/

The Site Sequence

The recovered material was found in eight deposits across the site and as machine finds (context 004). A single large fragment from a handmade brick in Fabric 1 was recovered from fill (016) of ditch [017]. This is the only Type 1 brick to have a partially reduced core possibly suggesting cracking during firing. Ditch [046] (fill 048) produced four very abraded fragments from three handmade bricks or slabs. One of these pieces is the only one to be found in Fabric 5. A large fragment from a handmade brick or slab was recovered from fill (050) of ditch [049]. Two fills (deposits 054 and 055) of ditch [053] produced a mixed group of three fragments. One edge flake is identifiable as coming from a handmade site Type 1 brick whilst the other two pieces are more difficult to be certain of their original form or purpose. A very abraded corner flake in Site Fabric 3 with a purposely shaped arch cut inside may be from an adapted hand-formed brick or slab whilst the other flake (the only piece in Fabric 4) has also been adapted but may be from a structural or salt-working associated brick.

Well or pit [112] (fill 111) produced five fragments from three handmade site Type 1 late medieval to early post-medieval bricks. Three of the pieces join to form a 130mm wide brick of 58mm thickness.

The only fragment of late medieval to early post-medieval site Brick Type 2 was recovered from waste deposit (119). Waste deposit (116) produced a very small edge flake from a Type 1 brick.

The remaining assemblage was recovered as machine finds (context 004). This group comprises two early modern pantiles, five hand-formed bricks or slabs and three pieces from a single hand squeezed wodge of clay in a fairly fresh condition.

Summary and Recommendations

A narrow range of ceramic building material, mainly consisting of late medieval to early post-medieval brick of probable 14th to 15th century date and hand-formed bricks or slabs probably associated with salt production. Salt-production related ceramic finds from the immediate area of the site are discussed by Lane (2020) together with a history of salt production in the area. The earliest use of the early structural brick found on the site is difficult to determine. Three of the deposits producing brick also contain groups of late 13^{ths} to 14th century pottery (the earliest group of probable late 13th to early/mid-14th century date comes from fill (055) of ditch [053] possibly suggesting a very early date for the bricks, however due to the nature of the site and the small groups recovered the pottery could be entirely residual in deposition. The brick may not have been used in a building as much early brick is used for structures such as drains, well or cess pits.

The two fragments of early modern pantile have been discarded. The other material should be retained but the hand-formed bricks/slabs and the fired clay will need careful packaging.

CLAY PIPE
By Denise Buckley

Introduction

Two clay pipes, together weighing 13.5g, were recovered during archaeological investigations at Sunnydale Close, Surfleet, Lincolnshire. The material was recorded in August 2022.

Analysis of the clay pipes followed the guidance published by Davey (1981) and the material is detailed in the accompanying table. Dating was taken from the bore size using the Harrington scale.

Condition

The clay pipes are in stable condition.

Results

Table 5 Clay Pipes

Context no.	Bore diameter /64"					NoF	W(g)	Comments	Date
	8	7	6	5	4				
004		2				2	13.5	Plain stems.	1650-1680
Totals		2				2	13.5		

Summary and Recommendations

Two plain stems dating to the second half of the seventeenth century were recovered during the initial machine stripping of the site. Apart from dating evidence they are of no further potential and can be discarded.

IRON SLAG

By Charles Simpson BSc (Hons), MA

Introduction

Seven items listed as slag were recovered from three contexts (054), (116) and (119) during archaeological investigations at Sunnydale Close, Surfleet, Lincolnshire, and were submitted for analysis and reporting. There was no provisional dating evidence available at the time of writing from ceramics evidence. The material was recorded in September 2022.

Methodology

The fragments were cleaned of surface debris, measured, weighed and macroscopically examined to identify diagnostic material and features. Exceptionally encrusted fragments were washed and dried in line with recommendations from Dungworth (pers.comm.) to reveal diagnostic surface features if present.

Full reference was made to published slag and crucible guides (Crew, 1995 & 1996; Dungworth et. al., 2012a, b & c; Historic England, 2015 & 2018; HMS, 2009; Tylecote, 1990) and reference material.

Results

A summary of the assemblage is recorded below in ***Table 6*** below.

Context No.	Material	Date	No. Pieces	Mass (g)	Comments
054	fas	?	1	17	Low density, vesicular, non-magnetic, yellowy / light grey fuel ash slag.
116	furn	?	1	292	Dense, non-vesicular, non-magnetic, dark grey furnace slag. Possible pcb frag.
119	furn	?	5	1914	Dense, non-vesicular, non-magnetic, dark grey and mottled furnace slag. Possible pcb frag.

furn = furnace slag (undiag.) pio = possible iron object tap = tap slag fas = fuel ash slag
shb = smithing hearth bottom pcb = plano-convex bottom blm = bloomery slag lin = furnace lining
(f_a) = fractured into multiple pieces imb = iron bloom orc = metal working orc cru = crucible
Rm = Roman (RB = Romano British) med = medieval pm = post medievalmod = modern

Discussion

The main assemblage was small in terms of overall numbers of fragments (7).

The fragment from context (054) was the smallest of the slag fragments recovered at 17g in mass. The single fragment is of low density, non-magnetic, vesicular and a yellowy / light grey in colour. Whilst this could be a

fuel ash slag, its light colouring, low mass and bubbly vesicular form suggest this material is more likely a low mass siliceous slag deriving from the heating of silica rich materials present in the areas surround fires used in the production of salt.

The next fragment was recovered from context (116) and was uniformly dense, non-magnetic, non-vesicular and dark grey in colour. This fragment has a moderately smooth edge to one side forming an arc. This fragment may be part of the slag that collects in the vase of a non-tapping furnace called a plano-convex bottom (pcb).

The final five fragments where the largest in physical size and mass and were recovered from context (119). The smallest of these five was dark grey in colour, dense, non-vesicular and non-magnetic. With a clearly identifiable top and bottom, this fragment also had features suggestive of a pcb that has been broken up.

The other four fragments from context (119) were dark brown / dark grey with mottled veins of a lighter material and orange crumbly oxidised patches. There was some evidence to orient a couple of the pieces but nothing to suggest further pcbs. The other couple of fragments also contained fragments of the charge jumbled in with the slag. This material represents undiagnostic furnace slag resulting from iron working. Even on the largest fragment, there was no evidence of flow on the slag.

The shape and lack of visible abrasion on the slag fragments recovered suggests they have not travelled far once deposition occurred.

Tapping furnaces were most common in British late Iron Age and the Roman period and fell into decline in favour of non-tapping furnaces until around the 9th-10th century when they rose in favour once more (Historic England, 2018).

Given the likely presence of pcbs and the lack of any visible flow, this collection of slag may have originated in non-tapping furnaces. Whilst this does fit into the earliest part of the current date range for the site and locale, it could be a localised difference in iron working technology carried this forward into the early medieval period.

This conclusion may be further supported by the ceramics evidence and more accurate dating of the fragments could be ascertained via further supplementary investigation (such as sectioning and via XRD / XRF analysis).

Recommendations

No further work is recommended at this stage. The two fragments of pcb from (116) and (119) (located in separate bags) should be retained as part of the archive and should pose no problems for long term storage. The rest of the material forming this assemblage may be discarded.

Any environmental samples taken from the features or deposits that produced slags, should be scanned for small fragments of metalworking debris such as hammerscale or other slag residues, which may indicate any associated industrial activity in the vicinity and provide further details of casting or smithing occurring in the vicinity.

Should further investigations be undertaken at any of the monitored locations, it would be advisable to seek appropriate advice on any sampling strategies.

OTHER FINDS

By Denise Buckley and Paul Cope-Faulkner

Introduction

Twelve other finds, together weighing 1138.2g, were recovered during archaeological investigations at Sunnydale Close, Surfleet. The material was recorded in August 2022.

Condition

The other finds are in stable condition, although the iron heavily encrusted.

Results

***Table** 7 Other Materials*

Cxt	Material	Description	NoF	W (g)	Date
004	Iron	Hinge. 125mm long, 4mm thick	1	113.1	Late Post Medieval
	Stone	Rhenish lava stone.	1	123.8	
016	Iron	Handle.	2	12.9	Late Post Medieval
052	Stone	Coarse grained sandstone; burnt. Natural. Discard.	1	713	LPM
084 /1\	Stone	Biconical heat affected chalk spindle whorl. Some horizontal and vertical cracks on surface; 38mm diameter, 28mm high, central perforation 10mm.	1	47.8	Lsax / Emed
109	Iron	Probable nail. Heavily encrusted.	1	14	Late Post Medieval
	Stone	Rhenish lava stone; pieces link.	4	80.8	
111	Glass	Glass – pale blue bead	1	<1	Medieval
141	Iron	Hinge strap	1	32.8	Late Post Medieval
Total			12	1138.2	

Range

The other finds were recovered from (004) machining finds, (014) deliberate backfill of silt-waste, (016) the fill of ditch [017], (052) the fill of ditch [049], (054) the fill of ditch [053], (084) silt-waste backfill, (109) silt-waste deposit, (141) the fill of ditch terminus [140] and comprise of iron and stone items.

Machining layer (004) and waste deposit (109) both produced fragments of Rhenish lava stone. Although the raw material was imported to manufacture items such as quern stones, there are no worked faces on these pieces to suggest that these are querns.
Fill (052) of ditch [049] produced a natural piece of coarse-grained sandstone which has been burnt.

Silt waste backfill (084) produced a stone spindle whorl (small find /1\). It has a characteristic late Saxon/early Medieval form. Pottery from this period was also recovered from this deposit. Similarly shaped examples found in Lincoln were from 10th to 12th century deposits, and in 11th to 14th century levels at Kings Lynn *(Clark and carter 1977, 315-16, no's 11 & 14)* and from a deposit containing mid-12th to mid-13th pottery at Huntingdon, Cambridgeshire *(Taylor, G., APS report 72/09)*.



Small find /1\, Stone spindle whorl from deposit (084)

Several iron items of late post medieval date were recovered – a hinge from machining layer (004), what is most likely a hinge strap from fill (141) of ditch terminus [140], a small drawer or cupboard handle from fill (016) of ditch [017] and what is most likely a nail, from waste deposit (109).

Summary and Recommendations

Several stone and iron items dating from the late Saxon/early Medieval period to the late Post Medieval period were recovered from machining, ditch fills and waste deposits. The items indicate domestic presence in the late Saxon/early Medieval and late post Medieval periods.

The iron items should be x-rayed to aid further identification. The stone from (052) can be discarded. The other stone and iron items should be retained as part of the site archive.

Abbreviations

ACBMG	Archaeological Ceramic Building Materials Group
BS	Body sherd
CBM	Ceramic Building Material
CXT	Context
LHJ	Lower Handle Join
NoF	Number of Fragments
NoS	Number of sherds
NoV	Number of vessels
PCRG	Prehistoric Ceramic Research Group
TR	Trench
UHJ	Upper Handle Join
W (g)	Weight (grams)

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Archive Catalogues

Archive catalogue 1, Post Roman Pottery

ext	ename	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
004	BAMWTS	Fabric 1	small jar ?	1	1	15		base		fully oxidised; untrimmed base; concretions incl breaks	0	0
004	BASS		large jar	1	1	60	long pressed rim edge	rim	DR 10	lid seated everted rim; ID; concretions incl. breaks	16	18
004	BERTII	coarse orange	jar ?	4	1	15 2		base		mid-17th to 18th; fairly fresh condition; int mid brown glaze with fe flecks; wear around under vasal edge; bead base; ext. purple/red slip; concretions incl. breaks	0	0
004	BL	GRE	small drinking vessel	1	1	6		BS		mid-16th to mid-17th; int & ext. glaze	0	0
004	BOU	fine OX/R/O X	jug	1	1	10		rim			13	10
004	BOU	OX fine sandy	small jug	1	1	6		BS		yellow/brown glaze	0	0
004	BOU	OX fine sandy	small jug / jar	1	1	8		BS			0	0
004	BOUA	Fabric A	large bowl	1	1	16		rim		int glaze; wear around inner rim ledge; int glaze; ext. soot; concretions incl. breaks	20	8
004	BOUA	Fabric A	large jar / bowl	2	1	72		BS		fairly fresh condition; ridged body; fresh break no joining sherds; part concretions incl. breaks	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
004	BOUA	Fabric A	small jar	1	1	12		rim		concretions incl. breaks	12	12
004	BOUA	Fabric A	small jug	3	1	31		rim & neck	DR 06	grooved neck; glaze; concretions incl. breaks	14	14
004	BOUA	Fabric A	small jug / jar	1	1	5		BS		concretions incl. breaks	0	0
004	BOUA	Fabric A/B	jar	1	1	17		BS		thick int glaze; concretions incl. breaks	0	0
004	BOUA	Fabric A/B	Jug / jar	1	1	18		BS		glaze; concretions incl. breaks	0	0
004	BOUA	Fabric A/B	Jug / jar	1	1	7		BS		internal deposit; concretions incl. breaks	0	0
004	BOUA	Fabric A/B	large jug	1	1	60		handle		grooved oval strap handle; concretions incl. breaks	0	0
004	BOUA	Fabric A/B	small jar	1	1	6		BS		concretions incl. breaks	0	0
004	BOUA	Fabric A/B	small jug	2	1	30		BS		unmatured glaze; concretions incl. breaks	0	0
004	BOUA	Fabric B	jar	1	1	37		base		int misfired glaze with patches abundant sand stuck in; concretions incl. breaks	0	0
004	BOUA	Fabric B	Jug / jar	1	1	8		BS		not a Bourne product; concretions incl. breaks	0	0
004	BOUA	Fabric B	large bowl	1	1	9		rim		fresh break no joining sherds; concretions incl. breaks	24	5
004	BOUA	Fabric B/C	small jar	1	1	5		BS		ridged shoulder; concretions incl. breaks	0	0
004	BOUA	Fabric B/C	small jar / bowl	1	1	13		BS		int glaze; abraded; concretions incl. breaks	0	0
004	BOUA	Fabric C	jar ?	1	1	11		BS		concretions incl. breaks	0	0
004	BOUA	Fabric C	small jar	2	1	5		BS		misfired glaze; concretions incl. breaks	0	0
004	CIST		cup	1	1	4		BS		Ext. & part int brown glaze; Bourne; fabric incl. odd ca. County Fabric Type Series	0	0
004	DST	Fabric B	small narrow neck jug / bottle	1	1	4		neck		tall, ridged neck; spalling cu glaze	0	0
004	DUTR		footed cooking pot / pipkin	1	1	34		foot		almost claw foot	0	0
004	EMHM	+ ca; East Anglia ?	small jar	4	1	76		BS		moderate ca; ext soot; fresh breaks no joining sherds; concretions incl breaks	0	0
004	EMHM	Bourne Fabric G/E	large bowl	1	1	44	pressed rim top	rim		square rim; ? ID: concretions incl. breaks	32	7
004	EST	Fabric A	pitcher?	1	1	6		BS		thick green glaze; incised shoulder groove	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
004	GRE		Jar / bowl	1	1	4		BS		int mid brown glaze	0	0
004	GRE		Jar / bowl	1	1	8		BS		int mid brown glaze	0	0
004	GRE		Jar / bowl?	1	1	1		BS		int mid brown glaze; fresh break no joining sherds	0	0
004	NDST		small jug	1	1	1		BS		? ID; thick cu glaze CFTS	0	0
004	NOTGL		jug	1	1	18		BS		cu glaze	0	0
004	SLBTOX	Fabric 2	jug	1	1	62	applied curved & vertical strips - ? Fleur de lys	BS		misfired/burnt reduced/amber glaze: ? ID; reduced core; concretions incl. breaks CFTS	0	0
004	SLIP	dull light orange	large bowl	1	1	16		rim		mid-17th to 18th; spalled int glaze; ext. orange slip; concretions incl. breaks	32	7
004	SLIP	light orange	large bowl	1	1	10		BS		mid-17th to 18th; spalled int glaze over white slip; ext. orange slip; concretions incl. breaks	0	0
004	SLIP	light orange	large bowl	1	1	22		rim		mid-17th to 18th; int spalling yellow glaze over white slip; ext. orange slip; wear mark around ext. rim edge; concretions incl. breaks	30	8
004	ST	Fabric A	Jar / bowl	1	1	2		BS			0	0
004	ST	Fabric A	small jar / pitcher	1	1	2		BS		thin glaze	0	0
004	ST	Fabric B	collared jar / pitcher	1	1	8		rim			15	13
004	ST	Fabric B	Jar / pitcher	2	1	5		BS		thin glaze	0	0
004	ST	Fabric B	miniature jar / cup	1	1	1		BS			0	0
004	ST	Fabric B	small jar / bowl	1	1	7		BS		Ext. soot; concretions incl. breaks	0	0
004	ST	Fabric B/C	Jar / bowl	1	1	17		BS		Ext. soot; knife trimmed body; concretions incl. breaks	0	0
004	ST	Fabric B/C	Jar / pitcher	1	1	14		BS		patchy thin glaze; concretions incl. breaks	0	0
004	ST	Fabric B/G	small jar / pitcher	1	1	19		base		orange-yellow glaze	0	0
004	ST	Fabric C	small jar / jug	1	1	3		BS		thin glaze	0	0
004	ST	Fabric G	small jar / pitcher	1	1	8		BS		orange-yellow glaze	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
004	STAMT		Jug / pitcher ?	1	1	98		BS		near vitrified firing; fabric as ST Fabric A + comm fine fe; sharp basal angle & edge; ext. spots glaze; ext. soot patch;? Id; concretions incl. breaks CFTS	0	0
004	TGW		small bowl ?	1	1	29		base		footring base with wear around; plain	0	0
004	TOY		jug	1	1	29		rim		rounded cuff rim; concretions incl. breaks	11	20
004	TOY		jug	1	1	26		base		'internal deposit; concretions incl. breaks	0	0
004	TOY		jug	7	1	106		BS		concretions incl. breaks	0	0
004	TOY		Jug / jar	1	1	6		BS		concretions incl. breaks	0	0
004	TOY		large jug / jar	1	1	13		BS		concretions incl. breaks	0	0
004	TOY	+ ca	jug	1	1	5		BS		unmatured glaze; concretions incl. breaks	0	0
013	ST	Fabric A	small jar	1	1	26		base		soot ext. & breaks; thin green glaze	0	0
013	ST	Fabric A	small jar/pitcher	2	1	8		BS		thin yellow green glaze	0	0
013	ST	Fabric A	small jar/pitcher	4	1	17		BS		thick light green glaze	0	0
013	ST	Fabric A/B	jar/pitcher	2	1	29		BS		thin orange-green glaze	0	0
013	ST	Fabric B	small jar/bowl	1	1	2		BS		Ext. soot	0	0
013	ST	Fabric B	small jar/pitcher	2	1	8		BS			0	0
013	ST	Fabric B	small jar/pitcher	1	1	2		BS		thin orange-green glaze	0	0
013	ST	Fabric B/G	small jar/bowl	1	1	8		BS		Ext. soot; trails int glaze	0	0
013	ST	Fabric C	small jar	2	1	14		base & BS		soot ext. walls & underbase; knife trimmed ext. above basal angle	0	0
014	BAEMWTS	Fabric 1	jar/bowl	4	1	10		BS		3x flecks; int & ext. soot; concretions incl. breaks	0	0
014	BAEMWTS	Fabric 1	large shallow bowl / dish	7	1	105		rim & BS	DR 12	Ext. carbonised deposit & soot; rounded rim with ext. bead; leached surfaces; concretions incl. breaks X1 sherd to CFTS	24	17
014	BAEMWTS	Fabric 2	large jar	1	1	7		rim		lid seated everted rim; ext. soot; fresh break no joining sherds; concretions incl. breaks CFTS	0	3

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
014	BAEMWTS	Fabric 2	large jar	14	1	169		rim & BS	DR 15	early medieval type rim; ext. soot; part leached; concretions incl. breaks	26	18
014	BAEMWTS	Fabric 2	large shallow bowl / dish	6	1	102		rim & BS	DR 13	simple upright rim; ext. soot; leached surfaces; concretions incl. breaks X1 sherd to CFTS	28	20
014	BASS		squat jar	1	1	9		rim	DR 16	unusual flat topped wedge rim;? ID: ext. soot; concretions incl. breaks	19	7
014	EMHM	East Anglia	small jar/bowl	2	1	7		BS		Ext. soot; concretions incl. breaks	0	0
014	SLEMS		small jar	1	1	2		BS		Ext. soot; concretions incl. breaks	0	0
014	SLQS		jar/bowl	2	1	10		BS		Ext. soot; flake; concretions incl. breaks	0	0
014	SLSNOL		small jar	1	1	8		BS		Ext. soot; concretions incl. breaks; concretions incl. breaks	0	0
014	SLSNOL		small jar/bowl	1	1	26		base		int & ext. soot; concretions incl. breaks	0	0
014	SLSNQCA		small jar	1	1	9	shallow finger pressings around rim edge	rim	DR 05	concretions incl. breaks	13	11
014	STCRUC	Fabric A	small hemispherical crucible ?	1	1	2		BS		Ext. fuel ash slag; concretions incl. breaks	0	0
016	BERTH	coarse light orange	large bowl	1	1	82		rim		late 17th to 18th; int red slip under int dark glaze; ext. orange slip; square bifid rim; wear around ext. lower rim edge	28	7
016	DST	Fabric B/C	small jug/jar	1	1	3		BS		thick cu speckled yellow glaze; concretions incl. breaks	0	0
016	ST	Fabric A	small jar/bowl	1	1	2		BS		soot int ext & breaks	0	0
031	BAEMWTS	Fabric 2	large shallow bowl/dish	2	1	27		rim & BS		upright rim; ext soot; concretions incl breaks	29	4
031	ST	Fabric B	small pitcher ?	1	1	3		neck			0	0
037	SLSNOL		jar/bowl	1	1	13		BS		ext soot; concretions incl breaks	0	0
037	ST	Fabric B/G	small pitcher ?	1	1	16		neck		thin glaze patch; burnt ?;ext soot; concretions incl breaks	0	0
038	ST	Fabric B	jug/pitcher	1	1	89		handle		strap handle; concretions incl breaks	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
039	BAEMWTS	Fabric 1	large shallow bowl/dish	1	1	57		rim	DR 11	ext carbonised deposit & soot; rounded rim with ext bead; leached surfaces; concretions incl breaks	24	7
039	BAMWTS	Fabric 1	jar/bowl	1	1	2		BS		ext soot; concretions incl breaks	0	0
039	BAMWTS	Fabric 1	large jar	1	1	59		rim	DR 18	everted rim; ext soot; concretions incl breaks	18	13
039	BAMWTS	Fabric 1	large jar	4	1	113		rim		everted rim: ext soot patch; concretions incl breaks X1 sherd to CFTS	20	20
039	BOUA	Fabric A	jar/bowl	1	1	3		BS		ext soot; concretions incl breaks	0	0
039	DST	Fabric B/C	small jug/jar	2	1	27		base		pale green cu speckled glaze; soot patch centre int base & ext walls & base	0	0
039	DST	Fabric C	small jug ?	2	1	71		base & BS		pale green cu speckled glaze; knife trimmed band above base; concretions incl breaks	0	0
039	EMIIM	+ ca;East Anglia ?	large jar	2	1	44		rim	DR 08	moderate to common ca; concretions incl breaks	19	17
039	EMHM	+ ca;East Anglia ?	small jar	3	1	22		base		ext soot; carbonised deposit int on walls; moderate fine ca; concretions incl breaks	0	0
039	EMIIM	East Anglia	small jar	1	1	7		BS		int & ext soot; concretions incl breaks	0	0
039	EMIIM	East Anglia	small jar	1	1	5		neck		concretions incl breaks	0	0
039	EMHM	East Anglia	small jar/bowl	2	1	7		base & BS		ext soot; concretions incl breaks	0	0
039	MEDX	OX fine-medium shelly	small jar	3	1	30		BS		wheelthrown; high fired; shell masked on surface; comm fine-med shell; concretions incl breaks	0	0
039	MEDX	OX med shelly	small jug/jar	2	1	10	several (2+) rows square roller stamping on shoulder	BS		STANLEY FABRIC A or CAMBS ?;common medium shell; ext soot; concretions incl breaks	0	0
039	SLEMS		jar/bowl	1	1	3		BS		ext soot;? ID; concretions incl breaks	0	0
039	SLEMS		small jar	1	1	14		BS		wheelthrown;? ID; ext soot; concretions incl breaks	0	0
039	SLOOL		small jar/bowl	2	1	22		base		handmade; thin walled; early medieval; ext soot: concretions incl breaks	0	0
041	BAEMWTS	Fabric 2	large shallow bowl/dish	1	1	21		rim		upright rim; ext soot; concretions incl breaks	26	4
041	BAMWTO		large jar	1	1	53		base		soot ext on walls & centre underbase; wear around basal edge; concretions incl breaks CFTS	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
041	BAMWTS	Fabric 1	jar	2	1	26		BS		ext soot; concretions incl breaks	0	0
041	BAMWTS	Fabric 1	large bowl ?	1	1	44		base		ext soot; concretions incl breaks	0	0
041	BAMWTS	Fabric 1	large jar	7	1	133		BS		ext soot; concretions incl breaks	0	0
041	BAMWTS	Fabric 1	miniature jar ?	1	1	7		base		concretions incl breaks	0	0
041	EMHM	East Anglia	jar/bowl	1	1	10		BS		ext soot; concretions incl breaks	0	0
041	MEDX	dull OX/light R/dull OX medium sandy	jar ?	1	1	28		BS		comm round to subround quartz most 0.2-0.4mm moderate to comm fine fe; ext soot; concretions incl breaks	0	0
041	SLEMO		jar	1	1	25		BS		thin walled; int manufacture finger pressings; ext soot; concretions incl breaks	0	0
041	ST	Fabric B	jug	1	1	9		rim		thin glaze	14	6
041	ST	Fabric B	jug/pitcher	1	1	3		handle		lower handle join; thin glaze; concretions incl breaks	0	0
041	ST	Fabric B	small jar/pitcher	1	1	2		BS		thin glaze	0	0
041	ST	Fabric B/C	small jar/pitcher	1	1	3		BS		orange-yellow glaze	0	0
041	ST	Fabric B/C	small jug/jar	1	1	3		neck		concretions incl breaks	0	0
041	ST	Fabric B/G	jar ?	1	1	5		neck			0	0
048	SLSNQCA		small jar	8	1	48		rim & BS	DR 04	patchy reduced/oxidised ext: ext soot patches; concretions incl breaks X2 sherds to CFTS	15	15
048	ST	Fabric B	pitcher	1	1	26		handle		lower handle join with 2 pressings; thick yellow/light green glaze; ext soot patch	0	0
048	ST	Fabric B	small jar/pitcher	1	1	8		BS		yellow glaze; int soot	0	0
052	ST	Fabric B	small collared jar/pitcher	1	1	25		BS		ext soot; concretions incl breaks	0	0
052	ST	Fabric B	small jar/pitcher	1	1	11		base		glaze; concretions incl breaks	0	0
054	DST	Fabric B	small jug/jar	19	1	238		base & BS		cu speckled yellow glaze; soot & carbonised deposit ext underbase & lower walls and soot patch int centre base; concretions incl breaks	0	0
054	EMHM	East Anglia	small jar/bowl	1	1	3		BS		concretions incl breaks	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
054	MEDX	orange-red fine micaceous sandy	jug	1	1	11		BS		Essex micaceous ?;amber glaze; ridged body; concretions incl breaks	0	0
054	SLBTOX	Fabric 1	small narrow necked jug/bottle	1	1	9		neck		thin walled; reduced core; thin ext glaze: slightly ridged neck with shallow grooves below; concretions incl breaks CFTS	0	0
054	SLSNOL		small collared jar	1	1	7		rim		wedge rim; soot int & ext; concretions incl breaks	12	8
054	ST	Fabric B	collared jar/pitcher	1	1	7		rim		thin glaze patch	11	6
054	ST	Fabric B	small vessel	1	1	1		BS		thin walled; ext soot	0	0
054	TOY		jug	1	1	31		BS		early; upper shoulder cordon; concretions incl breaks	0	0
055	BAEMWTS	Fabric 1	jar/bowl	1	1	6		base		ext soot; concretions incl breaks	0	0
055	BAEMWTS	Fabric 2	jar	1	1	13		BS		abraded; concretions incl breaks	0	4
055	BASS		large jar	3	1	62		rim & BS	DR 09	part ext soot on rim edge; lid seated everted rim:? ID; concretions incl breaks	25	12
055	BOUA	Fabric A	small jar	1	1	5		BS		thin walled; ext soot;int glaze spots: oee shell in fabric; base pressed out; concretions incl breaks	0	0
055	BOUA	Fabric A	small jug/jar	1	1	6		BS		concretions incl breaks	0	0
055	BOUA	Fabric C	small jar	1	1	18		base		ext soot; sharp angled base; fresh break no joining sherds; concretions incl breaks	0	0
055	EMHM	Bourne Fabric G/E	jar/bowl	1	1	6		BS		abraded; concretions incl breaks	0	0
055	EMHM	East Anglia	jar/bowl	1	1	6		BS		ext soot; concretions incl breaks	0	0
055	EMHM	East Anglia	small jar/bowl	1	1	2		BS		ext soot; concretions incl breaks	0	0
055	NOTGL		small jug	1	1	3		BS		light cu glaze	0	0
055	ST	Fabric B	small collared jar/pitcher	1	1	6		rim			8	12
055	ST	Fabric B	small jar/pitcher	1	1	9		base		thin yellow glaze; weararound basal edge	0	0
055	ST	Fabric B	small jar/pitcher	1	1	7		base		ext soot	0	0
055	ST	Fabric B/C	small jar/pitcher	1	1	5		BS		thin yellow glaze	0	0

ext	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
055	ST	Fabric B/G	small jar	1	1	3		BS		ext soot	0	0
055	TOY		small jug	1	1	4		BS			0	0
055	TOY		small jug	1	1	15		rim		rounded cuff rim; unmatured glaze	8	12
069	ELMAS		jar/bowl	1	1	18		BS		ext & part int soot; concretions incl breaks	0	0
069	ST	Fabric C	jar/bowl/ pitcher	1	1	6		base		thin glaze; concretions incl breaks	0	0
069	ST	Fabric C	small jar/bowl	1	1	1		BS		thin walled; soot int ext & breaks	0	0
075	DNEOT		small jar	1	1	8		rim		slightly everted rim; ext soot patch; punctate brachiopod; concretions incl breaks	12	9
075	ST	Fabric B	jar ?	1	1	6		BS		int soot; concretions incl breaks	0	0
075	ST	Fabric B	small jar	1	1	6		BS		thin walled; Int soot	0	0
075	ST	Fabric B/C	jar/pitcher	1	1	4		neck			0	0
075	ST	Fabric B/C	small jar/pitcher	1	1	19		BS		ext soot: fe deposits incl breaks	0	0
075	ST	Fabric B/G	small jar/pitcher	1	1	13		BS		thin yellow glaze; concretions incl breaks	0	0
075	ST	Fabric G	jar/pitcher	2	1	8		neck		yellow glaze; ext soot	0	0
075	ST	Fabric G/B	small pitcher	1	1	39		rim with spout	DR 03	ext yellow glaze; soot patch ext	10	13
077	BOUA	Fabric A	jar	1	1	23		BS		ext soot; fabric incl moderate to comm fe; concretions incl breaks	0	0
077	ST	Fabric A/G	miniature jar/bowl	1	1	2		base		burnt ?;ext soot	0	0
077	ST	Fabric B/C	small jar/bowl	1	1	11		base		knife trimmed ext	0	0
077	TOY		small jug	1	1	10		BS		ext soot patch; concretions incl breaks	0	0
082	ST	Fabric A	small jar/bowl	1	1	3		base		soot ext	0	0
082	ST	Fabric B/C	jar	6	1	10 1		rim & BS	DR 02	ext soot	12	40
084	EMHM	East Anglia	miniature jar	7	1	66		BS	DR 17	neck downwards; unusual shape; laminating; burnt;ext soot & int patches;;very thin walled; concretions incl breaks	0	0
084	SLEMS		small jar/bowl	1	1	7		BS		internal deposit; ext soot; fresh break no joining sherds; concretions incl breaks	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
084	ST	Fabric B/C	small jar	1	1	5		BS		concretions incl breaks	0	0
084	ST	Fabric C	jug	4	1	52		BS		thin glaze ;concretions incl breaks	0	0
084	TOY		jug	1	1	3		BS			0	0
089	BAEMWTS	Fabric 2	jar/bowl	7	1	13		BS		mainly thin flecks; ext soot; concretions incl breaks	0	0
104	ST	Fabric B	small jar ?	1	1	1		BS		thin glaze	0	0
109	BOUA	Fabric A	bowl ?	1	1	37		base		untrimmed basal edge; concretions incl breaks	0	0
109	BOUA	Fabric A	small jar	1	1	2		BS		concretions incl breaks	0	0
109	LSW2		jug	1	1	6		BS		cu glaze; concretions incl breaks	0	0
109	TOY		small jug	1	1	18		BS		concretions incl breaks	0	0
110	BOUA	Fabric A/C	jar/bowl	1	1	1		BS		concretions incl breaks	0	0
111	BOSTTT		small jug	1	1	8	applied vertical round profiled fe strips	neck		lower neck cordon; thick reduced suspension glaze; concretions incl breaks	0	0
111	EMHM	+ ca;East Anglia ?	jar/bowl	1	1	7		BS		ext soot; concretions incl breaks	0	0
111	EMIIM	East Anglia	jar/bowl	1	1	2		BS		concretions incl breaks	0	0
111	SLSHCW		jar/bowl	1	1	10		base		ext soot;? ID; concretions incl breaks; part leached	0	0
116	BOSTTT		small jug	2	1	27	applied vertical round profiled fe strips	BS		thick reduced suspension glaze; concretions incl breaks	0	0
116	BOUA	Fabric A	small jar	1	1	8		BS		ext soot; concretions incl breaks	0	0
116	LSW2		jug	1	1	13		rim		interned rim; early pocked suspension glaze	10	4
116	SLBTOX	Fabric 1	large jug	4	1	155		BS		fairly fresh condition; ridged body; runs reduced suspension glaze: internal deposit; fresh breaks no joining sherds; concretions incl breaks x1 sherd to CFTS	0	0
116	TOY		jug	2	1	34		BS		fresh break no joining sherds	0	0
116	TOY		small jug	1	1	34		base		part worn ext basal edge; concretions incl breaks	0	0

cxt	cname	sub fabric	form type	No. S	No. V	W (g)	decoration	part	ref no	description	rim diam	rim EVE
118	BOUA	Fabric B	large bowl	1	1	43		rim	DR 07	sloping rim; concretions incl breaks	28	7
118	EMHM	Bourne Fabric G/E	small jar/bowl	1	1	21		BS		ext soot;? ID; concretions incl breaks	0	0
119	BOSTTT		jug	1	1	18		BS		amber glaze: fresh break no joining sherds; concretions incl breaks	0	0
127	EMHM	East Anglia	jar/bowl	1	1	2		BS		concretions incl breaks	0	0
127	EMHM	East Anglia	small jar/bowl	1	1	2		BS		ext soot; concretions incl breaks	0	0
129	ST	Fabric B	small jar	1	1	2		BS		concretions incl breaks	0	0
132	SNEOT		large shallow bowl/dish	1	1	43		rim	DR 14	sloping rim; ext soot; leached;? ID; punctate brachiopod; concretions incl breaks	24	8
132	ST	Fabric A/G	collared jar/pitcher	1	1	22	incised wavy line dec on rim top	rim	DR 01	concretions incl breaks	15	15
141	ST	Fabric B	jar/pitcher	1	1	10		BS		glaze; concretions incl breaks	0	0
144	ST	Fabric A	small jar	1	1	9		BS		int & ext part soot; concretions incl breaks	0	0
144	ST	Fabric A/G	small jar/pitcher	1	1	3		BS		glaze	0	0
147	DST	Fabric B	jug/jar	1	1	1		BS		cu speckled yellow glaze	0	0
147	ST	Fabric C	small jar/jug	1	1	5		BS		thin yellow glaze	0	0

Archive catalogue 2, Ceramic Building Material

context	cname	fabric	sub type	frags	weight	description	date	width	thickness
004	FIRED CLAY	Site Fabric 3; orange	wodge	3	117	same object; fairly fresh condition; hand pressed wodge varying from 3mm to 35mm in thickness; multi finger & thumb pressing to upper & lower surfaces	-	0	0
004	HFBRK	Site Fabric 3; orange	brick/slab	1	174	very abraded; lump with small part ext flat surface ?;53=mm thick; patch salt surfacing	-	0	0
004	HFBRK	Site Fabric 3;orange	brick/slab	2	485	very abraded; joining frags; large flecks;1x edge flake; roughly flattened upper;52+mm thick;165+mm width/length	-	0	0
004	HFBRK	Site Fabric 3;orange	brick/slab ?	1	76	very abraded; inner core flake; concretions incl breaks	-	0	0
004	HFBRK	Site Fabric 3;orange	brick/slab ?	1	69	very abraded; edge flake; flattened upper	-	0	0

context	cname	fabric	sub type	frags	weight	description	date	width	thickness
004	HFBRK	Site Fabric 3;orange	brick/slab ?	1	61	very abraded; inner core lump; concretions incl breaks	-	0	0
004	PANT	fine red sandy		1	78	Mortar. Discarded.	late 19th to 20th	0	18
004	PANT	fine red sandy		1	8	mortar; flake. Discarded.	late 19th to 20th	0	0
016	BRK	Site Fabric 1; orange-red	Site Brick Type 1	1	216	edge flake; handmade brick; sand moulded stretcher; higher fired: sunken upper; veg marked; part reduced core;45+mm thick	late medieval to early post-medieval	0	0
048	HFBRK	Site Fabric 3;orange	brick/slab	2	253	same object; very abraded;1x flake: very roughly flattened upper/lower surface;62+mm;concretions incl breaks	-	0	0
048	HFBRK	Site Fabric 3;orange	brick/slab	1	208	very abraded; small part of a finger smoothed surface;78+mm thick; very uneven finger/thumb edge pressings	-	0	0
048	HFBRK	Site Fabric 5;red	brick/slab ?	1	101	very abraded; lump; small part flattened surface; concretions incl breaks	-	0	0
050	HFBRK	Site Fabric 3;orange	brick/slab	1	236	abraded; edge flake;2x roughly flattened surfaces at 95 degrees; yellow salt blush to original surfaces; side is part veg marked:57+mm thick	-	0	0
054	HFBRK	Site Fabric 3;orange	?	1	27	very abraded; corner flake;24+mm;purposely shaped with arch cut in side	-	0	0
055	BRK	Site Fabric 1;red	Site Brick Type 1	1	55	edge flake; handmade brick; slop mould; high fired; very rough underside surface - poss bedded on small pebbles; veg marked sides; high fired	late medieval to early post-medieval	0	0
055	FIRED CLAY	Site Fabric 4;orange-red	?	1	78	abraded; flake; flattened upper with diagonal groove with round profile into body; high fired;30+mm;concretions incl breaks	-	0	0
109	BRK	Site Fabric 2;red	Site Brick Type 2	1	229	handmade; slop moulded; high fired; bedding incl comm fine ea & abundant round to subround quartz grains of 0.3-0.4mm;salt surfaced upper; part stacking scar on stretcher	late medieval to early post-medieval	0	60
111	BRK	Site Fabric 1;orange	Site Brick Type 1	3	708	joining pieces;handmade;end;2x slop moulded sides & 1x sand moulded; sunken end margin; smoothed upper surface; some veg marking; unevenly bedded with abundant fine round to subround quartz	late medieval to early post-medieval	130	58
111	BRK	Site Fabric 1;orange-red	Site Brick Type 1	1	603	handmade; corner; higher fired: slightly concave upper; veg marked	late medieval to early post-medieval	0	60
111	BRK	Site Fabric 1;red	Site Brick Type 1	1	282	handmade; corner; slop moulded; part salt surfaced high fired; slightly sunken upper	late medieval to early post-medieval	0	0

context	cname	fabric	sub type	frags	weight	description	date	width	thickness
116	BRK	Site Fabric 1;red	Site Brick Type 1	1	7	edge flake; handmade brick; slop mould; high fired	late medieval to early post-medieval	0	0

Appendix 3

ENVIRONMENTAL ARCHAEOLOGY ASSESSMENT

By James Rackham

Introduction

Archaeological evaluation excavations conducted by Archaeological Project Services were undertaken at Sunnydale Close, Surfleet, Lincolnshire. Five environmental bulk soil samples were collected during the evaluation from Trench A for the recovery of biological remains and other archaeological debris. The samples were taken from the bottom fill of a well or deep pit, two other pits, a hearth 'rake out' in a pit and some large, concreted deposits (Table 8) in another pit and provide evidence of the human activities on site. The samples are provisionally dated to the Medieval period. The samples were submitted to the Environmental Archaeology Consultancy for processing and assessment and in addition the hand collected animal bone and marine shell has been identified and assessed.

The site lies on tidal flat deposits (http://mapapps.bgs.ac.uk/geologyofbritain/ home.html) on loamy and clayey soils of coastal flats with naturally high groundwater (http://www.landis.org.uk/soilscapes/) previously used for arable and grassland.

Table 8: Surfleet, Lincolnshire – SUSC22. Samples submitted for environmental assessment from Trench A

sample no.	context no.	sample volume (l)	sample weight kg.	feature	provisional date
1	111	29	37	Bottom fill of possible well or deep pit 112	medieval
2	098	28	35	Charcoal rich fill of pit 094	medieval
3	134	3	5	Burnt silt, top fill of pit 133	medieval
4	144	22	27	Fill of pit 146, charcoal rich fill of raked out hearths?	medieval
5	137	not recorded	10	Concreted silts – large pieces - fill of pit 136	medieval

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. Both residue and flot were dried and the residues subsequently re-floated to ensure the efficient recovery of charred material. The dry volume of the flots was measured and the volume and weight of the residues recorded. Sample 5 is a heavily concreted sediment. For this assessment this was observed under the microscope and checked for calcareous material but not broken down and washed. This will be undertaken during any subsequent phase of work on the site.

The residues were sorted by eye, and environmental and archaeological finds picked out, noted on the assessment sheets and bagged independently. A magnet was run through each residue in order to recover magnetised material such as hammerscale and prill and a count made of the number of flecks or spheroids of hammerscale where present. The residue was then discarded. The flot of each sample was studied using x30 magnifications and 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 flots were then bagged and along with the finds from the sorted residue, constitute the material archive of the samples.

The individual components of the samples were then preliminarily identified, and the results are summarised below in Tables 2-3.

Results

The samples washed down to a residue of concreted silty clay sediment, fired earth, root pseudomorphs and archaeological debris, including probable 'concreted ash' in some samples. The archaeological finds include

pottery, fired earth, animal bone, 'ash', hammerscale and a glass bead. In general, the archaeological debris is relatively limited but individual samples produced an abundance of different categories of material. A low level of flake and spheroidal hammerscale would suggest contemporary iron smithing nearby, although the densities are not high and could possibly derive from more recent activity with the small flecks and spheroids moving down through the soil through natural processes such as worm activity. This site was well outside the village in the 19th century so unless this hammerscale was introduced with manure it is likely to be contemporary with the medieval deposits. Sample 5 is full of what appears to be concreted 'ash', sample 1 has an abundance of charred cereal remains, the residue of sample 3 is almost entirely fired earth and sample 4 has an abundance of charred weed seeds but very little charred cereal grain so these samples clearly reflect local activities and dumping. Sample 2 contains over 0.9kg of concreted silts and fine sands. This material appears to include crystalline material and may be concreted by high concentrations of 'salts' derived from organic waste or urine, perhaps indicating something like a cess pit or animal waste.

The environmental evidence includes as well as the animal bone, charred cereal grain and chaff, culm nodes and possible charred 'straw', charred weed seeds, charcoal, uncharred seeds and snail shells (Table 10). There is little 'domestic animal bone waste' with a single fragment of sheep sized bone in sample 2, 3 burnt bone fragments in sample 1 and none in the other samples, although several bone fragments probably from the same skeleton of a dog are present in sample 1. Small vertebrate bones from the samples include rodent, field vole, shrew, frog/toad, bird, stickleback, other small fish and possible herring. The fish (other than stickleback) are likely to be food remains, but they occur at low densities or are absent from the samples. The charred remains include barley, wheat and probable rye grains, the barley apparently the most abundant, a little chaff, and an abundance of charred weed seeds in samples 1 and 4. The flot from sample 1 is dominated by small herbaceous stem charcoal fragments, possibly the debris from burnt straw, with small twig and very small roundwood charcoal. A similar charcoal assemblage, accompanied by possible straw and weed seeds is present in sample 4. There is an absence of any substantial charcoal in any of the samples, so the fuels on site clearly derive from small wood or peats, suggesting fuel selection or a lack of substantial trees that could be harvested for wood. Specific identification of the seeds and charcoal may help resolve their origin.

Table 9: Surfleet – SUSC22. Archaeological finds from the processed samples

sample no.	cont.	sample vol. l.	residue vol. (ml)	pot no/wt g	fired earth wt. g.	magnetic wt.g.	hammer-scale no.	marine shell wt g.	bone wt.g.	
1	111	29	90	2/5		<1	27fl 1sph		24	Glass – pale blue bead;
2	098	28	900	1/<1		<1	12fl		<1	933g concreted silts and fine sands
3	134	3	400		495	-	-			Fired earth -concreted (& fired?) silts & fine sands; ashy debris in flot;
4	144	22	95		4?	<1	4fl 1sph		<1	Fired earth- concreted-possibly burnt?; lots small ash in flot
5	137									All heavily concreted ash deposits. Not washed

fl- flecks of hammerscale; sph- spheroids of hammerscale;

Table 10: Surfleet – SUSC22. Environmental finds from the processed samples

sample no.	cont. no	sample vol. l.	flot vol. (ml)	char-coal $	charred grain *	chaff *	charred seed *	un-charred seed *	snails *	comments
1	111	29	1250	5/5	5+	4	5+	3	2	Charred barley, wheat and rye grain, chaff, weed seeds, 'straw', culm nodes, herbaceous stems; charcoal – abundant 'straw', twigs, small roundwood; uncharred seeds – incl. *Polygonum* sp., *Rumex* sp., *Chenopodium* sp., *Urtica* sp.; wood – uncharred roundwood; bone – 31 fragments (3 burnt), sveral bones from one dog skeleton?, rodent, shrew, frog/toad, bird, stickleback; snails – *Helix aspersa, Cochlicopa lubricella, Trochulus hispidus, Vertigo pygmaea, Vallonia costata, Carychium minimum, Galba truncatula*; ostracods;
2	098	28	7	1/3	1		2	2	4	Charred barley and wheat grain (poorly preserved), small,legumes, *Anthemis cotula*, small seeds, culm node; charcoal – small twigs, herbaceous stems, very little comminuted large wood; uncharred *Urtica* sp., *Sambucus* sp., *Chenopodium* sp, Asteraceae, *Persicaria* sp., Polygonaceae; bone 1 unburnt fragment, sheep size, field vole, small fish x1; snails *Cecilioides acicula* ++++, Vallonid, *Vallonia costata* (2), *Pupilla muscorum* (1), *Carychium minimum* (1), Planorbid (1); *Daphnia* sp.
3	134	3	1	1/1	1		1	1	2	Indet charred grain, weed seeds; charcoal – very little, comminuted; uncharred – couple seeds; snails *C. acicula*++, *Hydrobia* sp. (1);
4	144	22	51	2/5	1		5+	2	5	Charred barley? grain, lots small seeds, culm nodes, small legumes, pea/bean, grasses, Rumex sp., straw/grass stems; charcoal – very small roundwood, twigs, reeds, no substantial wood charcoal; uncharred *Rumex* sp., Asteraceae, *Chenopodium* sp., others; bone – no large bone, frog/toad (burnt), bird, small fish, herring?; snails *C. acicula* +++++, *Vallonia excentrica, V. coststa, , Vallonia pulchella, P. muscorum, V. pymaea, Vertigo antivertigo*, Succinideae, *Anisus leucostoma, Hydrobia ventrosa, Hydrobia ulva* – some burnt;
5	137									Not washed – concreted ash material, lots of inclusions – should be soaked and washed at the next stage

*frequency 1=1-10; 2=11-50; 3=51-150; 4=151-250; 5=>250; + present. $ - frequency of >2mm/<2mm fragments of charcoal

No marine shell was recorded in the samples, unexpected on a near the sea fenland site, perhaps reinforcing the lack of domestic food rubbish in the samples, although a few shells were hand collected during excavation. The charred cereal remains possibly derive from agricultural processing activity rather than food consumption, detailed analysis should establish this. A number of uncharred seeds were present in all four processed samples, but these are normally assumed to be of fairly recent origin but the presence of uncharred roundwood in context 111 indicates that there has been some waterlogged survival in this deposit so these seeds may be contemporary.

Environmental finds reflecting aspects of the local environment were recorded in samples 1-4. These included terrestrial and aquatic snails, ostracods, occasional *Daphnia* ephippia (the resting stage of a small freshwater crustacean), and the small vertebrates noted above. The terrestrial snails include taxa of 'catholic' habit and those found in open grassland habitats and marsh (Table 10), but the most abundant shell is *Cecilioides acicula*, a small blind burrowing species which is almost certainly intrusive in these deposits. One or two shells of freshwater aquatic taxa are present, and sample 4 includes shells typical of estuarine and brackish water environments (*Hydrobia ulva* and *Hydrobia ventrosa*) suggesting tidal influence or potentially reworking of shell rich marine sediments into the archaeological deposits.

Hand collected animal bone and marine shell

A small collection of 130 fragments and three partial skeletons of animal bone, weighing 7084 grammes, and six marine shells (38g.) were collected by hand during the excavations. The finds were recovered from twenty seven contexts (Table 12) including ditch fills, pit fills, backfill deposits, waste deposits and cleaning deposits. The bulk of the deposits are provisionally dated to the late Saxon and medieval periods, the 11th-13th century. The bones and shells were identified and catalogued following the procedures of the Environmental Archaeology Consultancy and the archive catalogue is presented in the Appendix. Identified finds include bones and/or teeth of horse, cattle, sheep/goat, sheep, pig, dog, dog or fox, cat, red deer, rabbit, chicken, fish, common mussel and oyster (Table 11). Two of the horse bones derive from a small adult animal of the size of a donkey or small pony. A metacarpus is the same length but slightly more robust than the donkey reference skeleton, while a humerus matches the donkey. Specific identification would require the use of ZooMS analysis (Stewart *et al* 2013).

Horse bones are the most abundant with contexts 111 and 116 producing the most fragments from at least three individuals one of which is the donkey/small pony. These bones may be derived from disturbed burials. Cattle fragments are the next most abundant, followed by sheep/goat (and sheep), with pig the other major domestic food species relatively uncommon (Table 11). The dog bones are also concentrated in contexts 111 and 116, with a partial skeleton in context 116 and parts of a skeleton in the bulk sample from 111 (Table 10). The partial skeleton in 116 is a large dog, still juvenile, while a much smaller canid provisionally assigned to 'dog or fox' is also present. The two bones in this category are similar in proportion to a large fox or a 'well' proportioned small dog. At least two animals of this size are present. The partial skeleton of a cat was also present in context 116. With several of the horse bones in context 116 potentially deriving from the same skeleton, and partial skeletons of dog and cat this 'waste deposit' appears to be reworked burials or a dumping ground for occasional carcasses. The red deer is represented by a single third phalanx, indicating the presence of bones (rather than antler) on the site, and therefore either skins or meat being used. Rabbit bones were present in three contexts with one of these, 77, containing a partial skeleton. It is possible that all these bones are intrusive, not just the skeleton, but the date of the contexts will be needed before this can be discussed. Only two chicken bones have been recovered in this hand collected assemblage, three fish bones (from larger fishes), in contrast to the samples where the bones were from small fishes. Six shells of common mussel and oyster were also recovered (see Tables 4 and 5, and Appendix).

Table 11. Sunnydale Close, Surfleet – SUSC22. Hand collected animal bone and marine shell.

Species	No. of fragments	Weight in g.
Horse	33	4027
Donkey/small pony	2	338
Cattle	28	1719
Cattle-size	17	155
Sheep/goat	16	312
Sheep	3	51
Sheep size	9	22
Pig	4	113
Dog	6 (+1*)	273
Dog or fox	2	11
Cat	1*	44
Red deer	1	7
Rabbit	2 (+1*)	33
Chicken	2	3
Fish	3	4
Unidentified	2	11
Common mussel	3	8
Oyster	3	30
Total	136 + 3*	7122

* Partial skeleton

The average fragment weight of the hand collected material excluding the identified skeletons is 52.2 grammes, which contrasts markedly from the bone finds sorted from the 2mm residue sieve of the samples with an average fragment weight of 0.78g. Even if some of the horse bones derive from the same skeleton the average hand collected bone fragment weight will far exceed that from the samples. Many of the fragments from the samples are not visually identifiable to a species but this difference in recovery would suggest that identifiable bones and teeth of the smaller domesticates and any small wild mammals, birds or fish will be under-represented in the hand collected assemblage.

Table 12. Frequency of fragments of each taxa or category by context.

context	004	007	013	014	016	027	037	039	044	054	055	056	069	075	077	082	084	102	109	111	116	118	120	127	132	144	147
Species	Cl	Pit	Bf	Bf	Di	Bf	Bf	Bf	Di	Di	Di	Di	Bf	Bf	Bf	Bf	Bf	Pit	Wd	Wpf	Wd	Wd	Wd	Dt	Di	Pit	di
Horse					1					1		2								12	17	1					1
Cattle	1		1	2							1	3				3		1		5	8					2	1
Cattle-size	1			1					1		2	5					1	1		3	2						
Sheep/goat	4				1							5	1							2		1			2		
Sheep	1																			1							1
Sheep size		1				1	1	2				1		1			1							1			
Pig	1					1												1	1								
Dog	1											1								2	2 (+1*)						
Dog or fox																				2							
Cat																					1*						
Red deer														1													
Rabbit											1				1*								1				
Chicken															1										1		
Fish			1											1											1		
Mussel																		3									
Oyster																					3						
Unidentified													1								1						

* partial skeleton

Cl-cleaning deposit; Pit – pit fill; Bf – backfill; Di – ditch fill; Dt – ditch terminus fill; Wd- waste deposit; Wpf – well/pit fill

Clearly the richer bone deposits such as ditch fill 056, well or pit fill 111 and waste deposit 116 would all benefit from a programme of sieving to ensure the unbiased recovery of the main domestic species and economically important game species. The smaller bones of fishes are best recovered through a programme of bulk sampling which should also be applied to all deposits sieved for smaller bones to act as a recovery/sampling control. The average number of zones per bone fragment recovered in the hand collected assemblage (excluding identified skeletons) is 1.6, a relatively low level of fragmentation (typically less than 1), potentially also a reflection of the poorer recovery of fragmented bones with no anatomical zones present.

The assemblage shows evidence for dog scavenging, a number of bones carry butchery marks, and a few fragments are burnt, indicating discard into a fire. Just one bone, one of the horse metatarsi, carries pathological features – pitting of the proximal articular surface and exostosis around the periphery of this facet.

A number of the fragments carry evidence for the age at death of the animals, either post cranial epiphyseal fusion or dental eruption and wear (see Appendix). The cattle include juvenile, immature and adult animals, the horse bones are primarily from adult animals with one or two immature animals and one foal represented. The sheep include juvenile, immature and adult animals and the pigs juvenile and sub-adult. A fairly large number of the bones also allowed measurements to be taken (27% of fragments - see Appendix) which would allow comparison with other sites and some internal analysis and consideration of the size of the farm stock.

Discussion

There are some indications that the sample and animal bone evidence suggest that the site lies on the periphery of an agricultural settlement. The evidence for dog, cat and possible horse burials, the probable burning of crop processing waste and straw, and the generally low level of most domestic food rubbish in the samples would be consistent with this interpretation. A very small, charred bone and burnt bone component in the samples and hand collected bone assemblage and limited substantial wood charcoal might also indicate little domestic fire debris, although if peat or turves were used this could be one explanation. The charred plant assemblages in samples 1 and 4 seem more likely to be associated with burning crop debris and processing waste than a domestic cooking fire, and detailed analysis should allow some interpretation of these assemblages. The low density of hammerscale might also reflect some iron smithing being undertaken nearby. The half a kilogramme of fired earth in context 134, the top fill in pit 133, described on site as a 'burnt silt' suggests either fire in the pit or the dumping of hearth floor material into the pit. The very small flot indicates minimal charred material in this deposit (Table 10). Neither this fill nor the underlying fill, 135, produced any animal bone during excavation so this pit is unlikely to have been a 'rubbish' pit. Sample 2 produced nearly a kilogramme of concreted silts and sands possibly indicative of animal or human waste and the fill (137) of pit 136 produced some concreted deposits, quite large lumps weighing 2-3 kilogrammes each. Although these include a number of visible inclusions including charcoal, vitrified siliceous matter, a little fired earth, silts, impressions of small round wood and possible reeds, burnt bone, and no doubt others they appear to be a concreted 'ash' deposit rather than a sediment or a calcareous deposit. These should probably be mechanically broken up and washed as a bulk sample to extract any identifiable material and perhaps clarify the character of the deposit, but a dump of 'ash' in the pit is the provisional interpretation.

The results of the ceramic and other dating were not available at the time of writing so the final dating for the sampled contexts and those producing the hand collected bone assemblage have not been considered in this report.

There is a limited number of finds indicating trade with the coast, a few marine shells and a couple of possible sea fish vertebrae, which is unusual on fenland sites near the coast which often have an abundance of shellfish and small fish bones, but if this area was on the periphery of an agricultural settlement, then this rubbish may have been discarded closer to the settlement focus.

Some evidence points to the local environmental conditions. The snails suggest an open grassland habitat, with some indications of wetland or marsh. A brackish or saline habitat is indicated by the shells of Hydrobids in sample 4 but whether these are reworked from the reclaimed tidal sediments that form the 'natural' on the site or reflect contemporary conditions is problematic. The latter seems unlikely if as described context 144 (sample 4) is a rake out from a hearth, unless the sediment that formed the base of the hearth was itself a shell rich tidal silt. It is possible that these estuarine shells may derive from sediments used to extract salt, although there is little or no evidence for saltern activity in the samples previous excavations in Surfleet (SUSC15) recorded a medieval saltern.

Further work

It would appear that there are a number of activities taking place in this area, possible crop processing, fires and hearths, carcass discard or burial and deposition of a limited amount of 'domestic' rubbish. Part of sample 5 should be carefully mechanically crumbled and washed as a bulk sample to extract the identifiable material from the concreted material so that it can be reported. Analysis of the concretions in sample 2 might also assist with the interpretation of why this material concreted. The detailed analysis of the charred plant remains and charcoal from all five samples should help to clarify the character of the activities on the site and therefore the 'nature' of the site. Donkey and small pony bones are rare on archaeological sites in Britain, or at least rarely identified, so the use of ZooMS to identify whether the remains are horse or donkey is important, and this technique could also be applied to the dog or fox bones. Where possible the fish bones should be identified to species to establish whether they are freshwater or marine species. Further analysis of the bone assemblage could be undertaken within a chronological framework when the dating for individual contexts has been established.

Identification and quantification of the snails in pits 094 and 146 should permit a more confident assessment of the local environment and origin of the snail assemblages, particularly which species are burnt and how many. Relatively close dating for the deposits would make the results more useful.

If further archaeological work is undertaken in this area, then a programme of sampling must be introduced since perhaps the most important evidence for the activities in this area can only be recovered by sampling. Samples of 30-40 litres should be taken from a range of features, feature types and cover the spatial and chronological extent of any archaeological features excavated. Bone rich deposits should be sieved on site on a 5 or 10mm mesh for the controlled recovery of small bones (this could be done by bulk sampling about 100 litres for subsequent wet-sieving off site), and all such contexts should also be bulk sampled to produce the controlled recovery of the smallest bones such as fish. The results from these should allow identification of the activities being undertaken at the site and any spatial pattern associated with these activities. The assemblages in these evaluation samples should be included in any subsequent post-excavation analyses, but if no further archaeological fieldwork is undertaken then these evaluation samples should be analysed as indicated above to create a dataset for comparison with other sites in Surfleet and the local fens.

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Key to codes used in the cataloguing of animal bones and marine shells

SPECIES:

SPECIES CODE			SPECIES CODE	
MAN	human		DOVE	Dove species
EQU	Horse		FER	Feral dove
EQSZ	Horse size		PART	Partridge
BOS	Cattle		SWAN?	Swan?
BOSL	Cattle-large		WOOD	Woodcock
CSZ	Cattle-size		CURL	Curlew
SUS	Pig		WADE	wader
OVCA	sheep or goat		CROK	Crow or rook
OVI	Sheep		CORV	Crow or rook
CRA	Goat		JACK	Jackdaw
SSZ	sheep size		OWL	Owl indet.
FEL	Cat		BUZZ	Buzzard
CAN	Dog		GULL	Gull sp.
AUR	Aurochs			
AUR?	Aurochs?		TURD	Turdidae
CER	red deer		BIRD	Identifiable but not id'd
DAM	Fallow deer		PASS	Passerine
CLS	roe deer		LBIRD	Large bird
LEP	Hare		UNIB	Bird indet
ORC	Rabbit			
LAG	Lagomorph		FROG	Frog
CARN	Carnivore		FRTO	Frog or toad
FOX	Fox			
POLE	Polecat/ferret			
WEA	weasel		GAD	Gadid, cod family
BADG	Badger		LING	Ling
SEAL	seal		HADD	Haddock
SQU?	Squirrel?		RAY	ray
BEAV	Beaver		FISH	Fish
ROD	Rodent		UNIF	Fish indet
RAT	Rat			
AGR	Field vole		OYS	oyster
ARV	Water vole		COK	Cockle
MUS	House mouse		MUSS	Common Mussel
SORA	Common shrew		WHELK	Common whelk
MOLE	Mole		HEL	Helix aspersa
SMA	Small mammal		HELIX	Helix sp.
UNI	Unknown		HELN	Helix nemoralis
			SNAIL	snail
CHIK	Chicken			
CHKZ	Chicken size		FOSS	Fossil bone
GOOS	Goose, dom			
GOOS?	Goose, dom.?			
GSSZ	Goose size			
GSSP	Goose species			
GOSZ	Goose, poss. Wild			
DUCK	Duck, domestic sp.			
DUCK?	Duck?			
DKSP	Duck species			
DSP	Duck species indet			
MALL	Duck, dom.			
TURK	Turkey			

BONE ELEMENT:

BONE CODE		BONE CODE	
SKEL	skeleton	SCP	scapula
SKL	skull	HUM	humerus
ANT	antler	RAD	radius
ANT?	antler?	ULN	ulna
ATT	antler tine	RUL	radius and ulna
HC	horn core	C/T	carpus/tarsus
TEMP	temporal	C23	carpus 2+3
FRNT	frontal	CAR	carpus
PET	petrous	CPA	accessory carpal
PAR	parietal	CPI	intermediate carpal
OCIP	occipital	CPR	radial carpal
ZYG	zygomatic	CPU	ulnal carpal
NAS	nasal	MTC	metacarpus
PMX	premaxilla	MC1-5	metacarpus 1-5
MAN	mandible	MTP	metapodial
MNT	mandibular tooth	MPL	lateral metapodial
DLI	deciduous lower incisor	INN	innominate
DLPM1-4	deciduous lower premolar 1-4	ILM	ilium
LI	lower incisor (and 1-3)	PUB	pubis
LC	lower canine	ISH	ischium
LPM1-LPM4	lower premolar 1-4	FEM	femur
LM1-LM3	lower molar 1 - molar 3	PAT	patella
MAX	maxilla	TIB	tibia
DUI	deciduous upper incisor	FIB	fibula
UI	upper incisor (1-3)	LML	lateral malleolus
UC	upper canine	AST	astragalus
DUPM	deciduous upper premolar	CAL	calcaneum
DUPM1-4	deciduous upper premolar 1-4	CQ	centroquartal
UPM1-UPM4	upper premolar 1-4	TAR3	tarsus 3
UM1-UM3	upper molar 1 - molar 3	T4	tarsus 4
MXT	maxillary tooth	TAR	tarsus
TTH	indeterminate tooth	MTT	metatarsus
INC	incisor	MT1-5	metatarsus 1-5
HYD	hyoid	MTL	lateral metatarsus
ATL	atlas	SES	sesamoid
AXI	axis	PH1	1st phalanx
CEV	cervical vertebra (and 3-7)	PH2	2nd phalanx
TRV	thoracic vertebra (and 1-13)	PH3	3rd phalanx
LMV	lumbar vertebra	PHL	lateral phalanx
SAC	sacrum	LBF	long bone
CDV	caudal vertebra	UNI	unidentified
VER	vertebra		
STN	sternum	CLV	clavicle
CC	costal cartilage	COR	coracoid
RIB1	first rib (2 etc)	CMP	carpo-metacarpus
RIB	rib	CMC	carpo-metacarpus
		WPH1-3	wing phalanges 1-3
URO	urostyle	WPH	wing phalanx
		LSA	lumbosacrale
DENT	dentary		
CLEI	cleithrum		
RAY	fin ray		
SHELL	shell		
UV	upper valve		
VAL	valve		

NUMBER: number of fragments in the entry

SIDE: W - whole L - left side R - right side F - fragment

FUSION: records the fused/unfused condition of the epiphyses
P - proximal; D - distal; E - acetabulum; N - unfused; F - fused; C - cranial; A - posterior

ZONES: records the part of the bone present.
The key to each zone on each bone is on page 4

BUTCHERY: records whether a bone has been chopped (CH), cut (KN), worked (W), burnt (C)

GNAWING: records if a bone has been gnawed by dogs (DG), cats (FEL) or rodents (RG)

TOOTH WEAR - Codes are those used in Grant, A. 1982 The use of tooth wear as a guide to the age of domestic animals, in B.Wilson, C.Grigson and S.Payne (eds) *Ageing and sexing animal bones from Archaeological sites*, 91-108.

Teeth are labelled as follows in the tooth wear column:

Deciduous	Permanent
f ldpm2/dupm2	F lpm2/upm2
g ldpm3/dupm3	G lpm3/upm4
h ldpm4/dupm4	H lpm4/upm4
	I lm1/um1
	J lm2/um2
	K lm3/um3

MEASUREMENTS: Any measurements are those listed in A.Von den Driesch (1976) *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum Bulletin 1, Peabody Museum, Harvard, USA

Some measurments have been taken on juveniles. Measurements marked L1 are the greatest length of long bones lacking one unfused epiphysis – the measurement being taken from the epiphyseal junction. Measurements marked L2 are the greatest length of the long bones between epiphyseal junctions when both epiphyses are unfused.

PATHOLOGICAL: A 'P' indicates that the bone fragment carries a pathology

COMMENTS: This may include a short description of the fragments, any pathologies, butchery or gnawing evidence

PRESERVATION: records the condition of the bone in the following manner

1- enamel only surviving
2- bone very severely pitted and thinned, tending to break up; teeth with surface erosion and loss of cementum and dentine
3- surface pitting and erosion of bone, some loss of cementum and dentine on teeth
4- surface of bone intact, loss of organic component, material chalky, calcined or burnt
5- bone in good condition, probably with some organic component

ZONES - codes used to define the zones on each bone

SKULL	1. paraoccipital process	METACARPUS	1. medial facet of proximal articulation, MC3
	2. occipal condyle		2. lateral facet of proximal articulation, MC4
	3. intercornual protuberance		3. medial distal condyle, MC3
	4. external acoustic meatus		4. lateral distal condyle, MC4
	5. frontal sinus		5. anterior distal groove and foramen
	6. ectorbitale		6. medial or lateral distal condyle
	7. entorbitale		
	8. temporal articular facet	FIRST PHALANX	1. proximal epiphysis
	9. facial tuber		2. distal articular facet
	0. infraorbital foramen		
		INNOMINATE	1. tuber coxae
MANDIBLE	1. Symphyseal surface		2. tuber sacrale + scar
	2. diastema		3. body of illium with dorso-medial foramen
	3. lateral diastemal foramen		4. iliopubic eminence
	4. coronoid process		5. acetabular fossa
	5. condylar process		6. symphyseal branch of pubis
	6. angle		7. body of ischium
	7. anterior dorsal ascending ramus posterior M3		8. ischial tuberosity
	8. mandibular foramen		9. depression for medial tendon of rectus femoris
VERTEBRA	1. spine	FEMUR	1. head
	2. anterior central epiphysis		2. trochanter major
	3. posterior central epiphysis		3. trochanter minor
	4. centrum		4. supracondyloid fossa
	5. neural arch		5. distal medial condyle
			6. lateral distal condyle
SCAPULA	1. supraglenoid tubercle		7. distal trochlea
	2. glenoid cavity		8. trochanter tertius
	3. origin of the distal spine		
	4. tuber of spine	TIBIA	1. proximal medial condyle
	5. posterior of neck with foramen		2. proximal lateral condyle
	6. cranial angle of blade		3. intercondylar eminence
	7. caudal angle of blade		4. proximal posterior nutrient foramen
			5. medial malleolus
HUMERUS	1. head		6. lateral aspect of distal articulation
	2. greater tubercle		7. distal pre-epiphyseal portion of the diaphysis
	3. lesser tubercle		
	4. intertuberal groove	CALCANEUM	1. calcaneal tuber
	5. deltoid tuberosity		2. sustentaculum tali
	6. dorsal angle of olecranon fossa		3. processus anterior
	7. capitulum		
	8. trochlea	METATARSUS	1. medial facet of proximal articulation, MT3.
	9. coronoid fossa		2. lateral facet of proximal articulation, MT4
	0. teres tubercle		3. medial distal condyle, MT3
RADIUS	1. medial half of proximal epiphysis		4. lateral distal condyle, MT4
	2. lateral half of proximal epiphysis		5. anterior distal groove and foramen
	3. posterior proximal ulna scar and foramen		6. medial or lateral distal condyle
	4. medial half of distal epiphysis		
	5. lateral half of distal epiphysis		
	6. distal shaft immediately above distal epiphysis		
ULNA	1. olecranon tuberosity		
	2. trochlear notch- semilunaris		
	3. lateral coronoid process		
	4. distal epiphysis		

Archive catalogue of hand collected animal bone and marine shell from Surfleet – SUSC22

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
SUSC22	004	BOS	INN	1	L		7						ISCHIAL SHAFT	4
SUSC22	004	CAN	RAD	1	R								MIDSHAFT	4
SUSC22	004	CSZ	LBF	1	F								INDET SHAFT FRAGMENT	4
SUSC22	004	OVCA	CAL	1	L	PF	123				GL-60 Pb-14.8 Dp-17.1 Dd-23.6		COMPLETE	4
SUSC22	004	OVCA	MAN	1	L					d11 I7J4			HORI RAMUS FRAG WITH DP4 AND M1-M2 LOST BUT ERUPTING	4
SUSC22	004	OVCA	TIB	1	L		4				SD-15.4		PROX AND MIDSHAFT	4
SUSC22	004	OVCA	TIB	1	R								DISTAL MIDSHAFT-SL POROUS	4
SUSC22	004	OVI	MTC	1	R	DF	12345	CH			GL-124 Bp-23.3 Dp-15.4 SD-12.2 Bd-25.3 Dd-15.8		COMPLETE-HIGH WAISTED - GRACILE	4
SUSC22	004	SUS	LC	1	R								MALE CANINE-VERY ,LITTLE WEAR	4
SUSC22	007	SSZ	CEV	1	F								ANT ZYGAPOPHYSIS	4
SUSC22	013	BOS	MTT	1	L				DG		SD-20.9		MOST OF SHAFT-BOTH ENDS CHEWED	4
SUSC22	013	FISH	TOID	1	F								TO IDENTIFY	4
SUSC22	014	BOS	HUM	1	R		69	CH			SD-25.4		DISTAL THIRD SHAFT-DISTAL CHEWED OFF-SHAFT CHOPPED	4
SUSC22	014	BOS	PH2	1	R	PF	12						COMPLETE	4
SUSC22	014	CSZ	RIB	1	L			CH					MID-DISTAL SHAFT-DISTAL END CHOPPED MEDIALLY	4
SUSC22	016	EQU	FEM	1	L	PF	1						MOST OF CAPUT	4
SUSC22	016	OVCA	RAD	1	R	PF	123	CH			Bp-33.6 Dp-17.5		PROX HALF-DISTAL SHAFT CHOPPED	4
SUSC22	027	SSZ	RIB	1	L			C					CALCINED PROX SHAFT	4
SUSC22	027	SUS	MAN	1	R		7			I7J4			POST TOOTH ROW-M1 AND 2-M3 UNERUPTED-POROUS	4
SUSC22	037	SSZ	RIB	1	F								VERY POROUS-RIB SHAFT-COSTAL CARTILAGE?	4
SUSC22	039	SSZ	LMV	1	F	CFAF	2345	C					FOUR FRAGMENTS-BURNT-SHEEP/GOAT	4
SUSC22	039	SSZ	RIB	1	F								MIDSHAFT	4
SUSC22	044	CSZ	RIB	1	F								SHAFT FRAGMENT	4
SUSC22	054	EQU	MAN	1	F								ANT FRAG HORI RAMUS WITH 2	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
													INCISORS-WELL WORN-3 PIECES	
SUSC22	055	BOS	MTT	1	R			C			SD-15.5		MIDSHAFT-SMALL-POROUS-JUV-MIDSHAFT CHOPPED	4
SUSC22	055	CSZ	FEM	1	R	DN							PART ZONE 7	4
SUSC22	055	CSZ	RIB	1	F								PROX SHAFT- 4 PIECES	4
SUSC22	055	ORC	FEM	1	L	PND							SHAFT ONLY	4
SUSC22	056	BOS	AST	1	R		1						PROUS-JUV-SAME LIMB AS CAL	4
SUSC22	056	BOS	CAL	1	R	PN	23						COMPLETE EXCEPT FOR PROX EPI-SMALL-POROUS-JUV	4
SUSC22	056	BOS	TIB	1	R								LATERAL MIDSHAFT FRAGMENT	4
SUSC22	056	CAN	LMV	1	W	CFAF	12345						ONLY SLIGHT DAMAGE	4
SUSC22	056	CSZ	FEM	1	F								SHAFT FRAGMENT-SMALL-POROUS-JUV-ERODED	3
SUSC22	056	CSZ	RIB	1	F								SHAFT FRAGMENT	4
SUSC22	056	CSZ	RIB	1	F								DISTAL SHAFT FRAGMENT	4
SUSC22	056	CSZ	UNI	1	F								INDET-SL ERODED	3
SUSC22	056	CSZ	UNI	1	F								POSS FRAGMENT PROX TIB-FUSED	4
SUSC22	056	EQU	MAN	1	L		1237			GHIJK			FRAGMENTED - 16 FRAGMENTS-TEETH ME-WELL WORN	4
SUSC22	056	EQU	RIB	1	R	PF	1						PROX END	4
SUSC22	056	OVCA	HC	1	L								DISTAL HALF-LARGESOMEWHAT OVOID-LOOKS BIT LIKE BOS	4
SUSC22	056	OVCA	LMV	1	R	CF		CH					RIGHT SIDE CENTRUM+ANT ZYGA-CHOPPED DOWN MIDDLE	4
SUSC22	056	OVCA	MAN	1	L		678			J15K12			POST HORI RAMUS AND VENTRAL HALF ASC- WITH M2 AND M3	4
SUSC22	056	OVCA	MAN	1	R		7			K10			POST HORI RAMUS WITH LM3 AND Z7	4
SUSC22	056	OVCA	RIB	1	R	PN	1						PROX THIRD	4
SUSC22	056	SSZ	RIB	1	R								MID AND DISTAL SHAFT	4
SUSC22	069	OVCA	TIB	1	R	PN	2						FRAG UNFUSED PROX EPI	4
SUSC22	069	UNI	SKL	1	F								DORSAL FRAG-FRONTAL/FACIAL	4
SUSC22	075	CER	PH3	1	L		1				GL-49.3 HT-27.3		COMPLETE	4
SUSC22	075	SSZ	RIB	1	F			CH					PROX MIDSHAFT-BOTH ENDS CHOPPED-POROUS-JUV	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
SUSC22	075	FISH	UNI	1	F								INDET LARGE FISH RAY	4
SUSC22	077	CHIK	SCP	1	F								SCAULA BLADE	4
SUSC22	077	ORC	SKEL	1	P								37 FRAGMENTS-FEM-TIB-HUM-RIB-VERT-SKL-MTP-INN-SAC-ETC-ADULT	4
SUSC22	082	BOS	CEV	1	F		15	CH					NEURAL ARCH AND SPINE-CHOPPED MED-LAT THRU CANAL	4
SUSC22	082	BOS	FEM	1	L		4						DISTAL SHAFT-Z4	4
SUSC22	082	BOS	RIB	1	R			CH					ANT RIB-PROX SHAFT-DISTAL END CHOPPED	4
SUSC22	084	CSZ	LBF	1	F			C					INDET CHARRED SHAFT FRAGMENT	4
SUSC22	084	SSZ	LBF	1	F								INDET SHAFT FRAGMENT	4
SUSC22	102	BOS	MAN	1	R		2			fgh14 I9			ANT HORI RAMUS WITH DP2-M1-3 PIECES	4
SUSC22	102	CSZ	UNI	1	F								INDET FRAGMENT	4
SUSC22	102	MUSS	VALV	3	E								PARTS OF 3 VALVES	4
SUSC22	102	SUS	TIB	1	L	DF	567				SD-18.6 Bd-25.9 Dd-23.6		DISTAL END AND 2 THIRDS SHAFT- Z4 NOT PRESENT	4
SUSC22	109	SUS	TIB	1	R		4	CH	DG		SD-18.6		MIDSHAFT-PROX END CHEWED-DISTAL END CHOPPED-POROUS-JUV/IMM	4
SUSC22	111	BOS	HUM	1	L		0	CH	DG				PROX SHAFT-PROX END CHEWED-MIDSHAFTCHOPPED-SL POROUS	4
SUSC22	111	BOS	HUM	1	R		690	CH			SD-29.3		MOST OF SHAFT-DISTAL END CHOPPED	4
SUSC22	111	BOS	SCP	1	F								FRAGM,EMNT OF CAUDAL MARGIN	4
SUSC22	111	BOS	TIB	1	R		4				SD-.23.2		MOST OF SHAFT-SMALL-JUV-FLAKING	3
SUSC22	111	BOS	TRV	1	L	CNAN		CH					LEFT SIDE CENTRUM-CHOPPED DOWN MIDDLE	4
SUSC22	111	CAN	LMV	1	W	CFAF	12345						COMPLETE EXCEPT FOR TRANS PROCESSES	4
SUSC22	111	CAN	TIB	1	L	DF	4567				SD-15.2 Bd-29 Dd-20.6		DISTAL END AND MOST OF SHAFT	4
SUSC22	111	CSZ	HUM	1	L	DF	8						FRAGMENT OF DISTAL LATERAL ARTIC-HORSE/	4
SUSC22	111	CSZ	LMV	1	R	AN							POST FRAGMENT OF CENTRUM	4
SUSC22	111	CSZ	UNI	1	F								INDET	4
SUSC22	111	DOF	ULN	1	R	PF	123						PROX END AND SHAFT-SMALL WELL	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
													PROPORTIONED DOG OF FOX	
SUSC22	111	DOF	ULN	1	R	PF	123						PROX END AND SHAFT-LARGE FOX OR SMALL WELL PROPORTIONED FOX-BIGGER THAN ABOVE	4
SUSC22	111	EQU	FEM	1	L	PCD	1348		DG		DC-52 SD-35.6		PROX END AND SHAFT-DISTAL CHEWED-PROX SUT VIS	4
SUSC22	111	EQU	LC	2	W								LEFT AND RIGHT CANINES	4
SUSC22	111	EQU	LM	1	W								MED WEAR	4
SUSC22	111	EQU	MAN	1	F		123123						SYMPHYSIS WITH CANINE ALVEOLI AND PM2 ON LEFT SIDE	4
SUSC22	111	EQU	MTC	1	L		1						PROX THIRD	4
SUSC22	111	EQU	MTT	1	L	DF	12345				GL-270 SD-27 Bd-44.8 Dd-34.8	P	COMPLETE-EXOSTOSIS AROUND PROX ARTIC AND SURFACE POF ARTIC	4
SUSC22	111	EQU	RIB	3	L	PF	1						PROX THIRD	4
SUSC22	111	EQU	TIB	1	L	PFDF	1234567				GL-333 Bp-88.4 Dp-77.3 SD-36 Bd-67 Dd-41		COMPLETE	4
SUSC22	111	EQU	TRV	1	F	CFAF	12345						PERIPHERAL DAMAGE AND DISTAL SPINE BROKEN	4
SUSC22	111	OVCA	HUM	1	L	DF	67890				SD-14.7 BT-31.7 HT-20.1		DISTAL END AND SHAFT	4
SUSC22	111	OVCA	MAN	1	L					K12			HORI RAMUS FRAG WITH M3 AND P4-M2 ALVEOLI-2 PIECES	4
SUSC22	111	OVI	HC	1	F								FRAGMENT OF MALE HC	4
SUSC22	116	BOS	FEM	1	L	PF	123	CH			DC-46		DAMAGED PROX END-CHOPPED FROM SHAFT	4
SUSC22	116	BOS	FEM	1	L		4	CH	DG				DISTAL SHAFT FRAG WITH Z4-SHAFT END CHOPPED-DISTAL CHEWED	4
SUSC22	116	BOS	HUM	1	L	DF	789	CH			BT-77.9 HT-40.6		DISTAL CONDYLE AND PART ANT DISTAL SHAFT-CHOPPED THRU DISTAL SHAFT	4
SUSC22	116	BOS	INN	1	R	EF	59	CH					POST FRAG ILIUM WITH PART ACETAB-CHOPPED THRU ACETAB	4
SUSC22	116	BOS	MAN	1	L		678		DG	K10			CHEWED ANGLE WITH M3 AND Z7	4
SUSC22	116	BOS	RAD	1	R	DN	45						DISTAL EPIPHYSIS	4

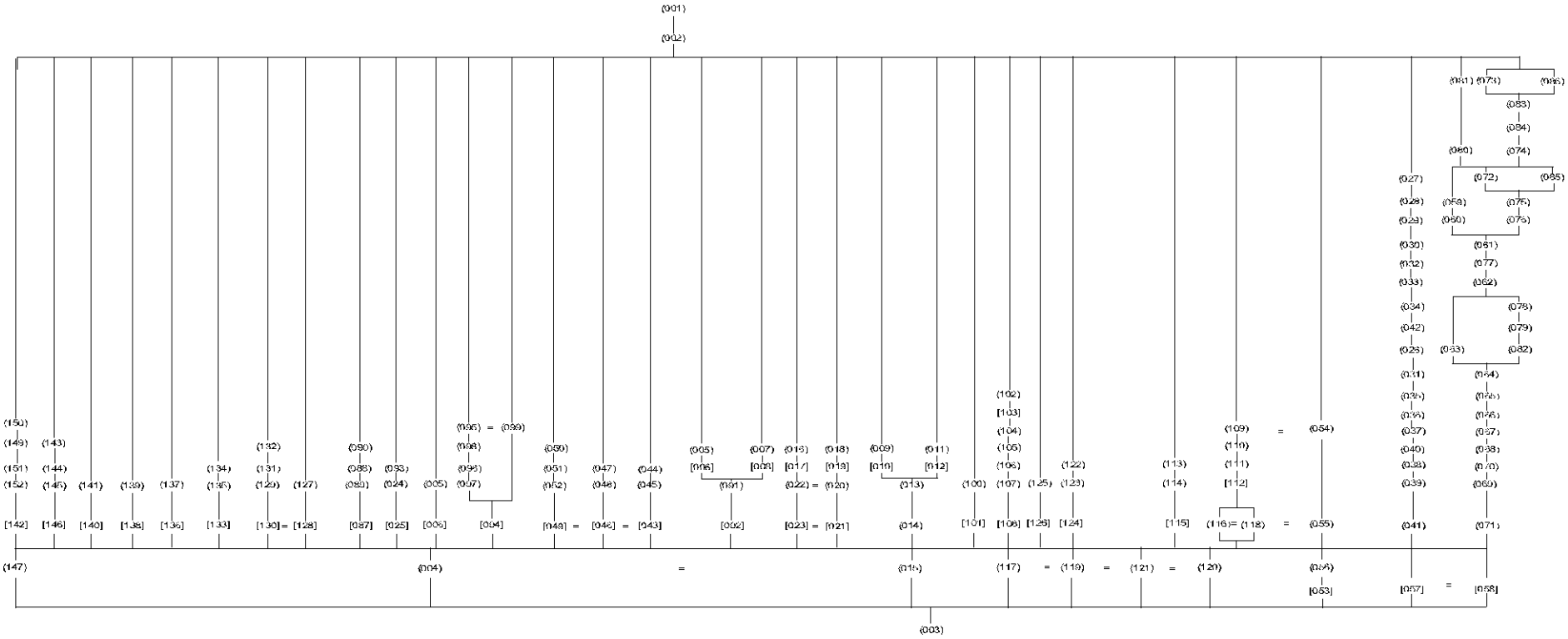
site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
SUSC22	116	BOS	SKL	1	F								FRAGMENTED SKULL-18 PIECES-MAXILLA FRAG-BASI-OCCIP, FAC FRAGS	4
SUSC22	116	BOS	TIB	1	L	DN	7						DISTal shaft-epi unfused- 2 pieces	4
SUSC22	116	CAN	MT3	1	R	DF	123				GL-57.2		COMPLETE	4
SUSC22	116	CAN	SKEL	1	P						MT5-GL-88.1 MT5-Bd-11.2 MT4-GL-102.1		MAN, FEM,TIB,MTP,PHAL,TII-13 PIECES-FEM-PN,TIB-DN,MTP-DJ,PHAL-PJ-LARGE DOG	4
SUSC22	116	CAN	ULN	1	R	PF	123						PROX END AND SEMILUNARIS-BIGGER THAN FOX	4
SUSC22	116	CSZ	LBF	1	F								INDET SHAFT FRAGMENT	4
SUSC22	116	CSZ	RIB	1	L	PN	1	CH					PROX END-SHAFT CHOPPED-POSS LARGE PIG??	4
SUSC22	116	EQU	HUM	1	L	DF	67890				SD-34.6 BT-72.5 HT-52.8		DISTAL AND AND SHAFT- 2 PIECES	4
SUSC22	116	EQU	HUM	1	R	DF	67890		DG		SD-25.7 BT-60		DISTAL END AND SHAFT-PROX END CHEWED-PONY/DONKEY/MULE?	4
SUSC22	116	EQU	INN	1	L	EF	23579				SH-34.8 SB-22		ILIAL AND ISCHIAL SHAFT, SCAR AND PART ACETAB-PAIR OF ABOVE	4
SUSC22	116	EQU	INN	1	R	EF	357				SH-34 SB-21		ISCHIAL AND ILIAL SHAFT WITH PART ACETAB	4
SUSC22	116	EQU	INN	1	R	EF	57						ISCHIAL SHAFT WITH PART ACETAB	4
SUSC22	116	EQU	LML	1	W		1						COMPLETE	4
SUSC22	116	EQU	LMV	1	F	CFAF	12345						ANT THORACIC-CENTRUM, ARCH AND BASE SPINE	4
SUSC22	116	EQU	LMV	1	F	CFAF	234						CENTRUM	4
SUSC22	116	EQU	MAX	1	L					fgF3G3			LOOSE DP2 AND 3 WITH UNERUPTED PREMOLARS BENEATH- 5 PIECES	4
SUSC22	116	EQU	MTC	1	L	DF	12345				GL-214 Bp-48.6 Dp-32.1 SD-30.1 Bd-47.4 Dd-35.2		COMPLETE	4
SUSC22	116	EQU	MTC	1	R	DF	12345				GL-188 Bp-43.4 Dp-25.4 SD-26.8 Bd-39.5 Dd-29		COMPLETE-PONY/DONKEY/MULE? +MPLX2 TINY BIT MORE ROBUST THAN REF DONKEY	4
SUSC22	116	EQU	MTT	1	L	DF	12345				GL-250 Bp-47.3 Dp-38.6 SD-28.8 Bd-		COMPLETE	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
											45.8 Dd-36.4			
SUSC22	116	EQU	PH1	1	W	PF	12				GL-83 Bp-52.3 Bd-43.8 Dp-34.5		COMPLETE	4
SUSC22	116	EQU	RAD	1	F	DN							ANT DISTAL SHAFT FRAGMENT-EPI UNFUSED-IMM- 2 PIECES	4
SUSC22	116	EQU	RAD	1	L	DF	456				Bd-66.7 Dd-42.4		DISTAL HALF - 4 PIECES	4
SUSC22	116	EQU	TIB	1	L						SD-41.5		MID 2 THIRDS OF SHAFT	4
SUSC22	116	EQU	ULN	1	L		23		DG				SEMILUNARIS FRAG-TOP OLECRANON CHEWED OFF	4
SUSC22	116	FEL	SKEL	1	P	PFDF					TIB-GL-101.2 FEM-GL-94 HUM-GL-86.8 RAD-GL-63		PARTIAL SKELY-ALL FUSED-TIB, FEM,HUM,INN,SAC,MTP-SCP-CAL,ETC-22 BONES,ULN,RAD	4
SUSC22	116	OYS	UV	1	W								UPPER VALVE – 4g	4
SUSC22	116	OYS	LV	2	W								LOWER VALVES – 26g	4
SUSC22	116	UNI	FEM	1	F	DN							DITAL SHAFT- 2 PIECES-UNFUSED-	4
SUSC22	118	EQU	MAN	1	L		5						FRAG ASC RAMUS WITH CONDYLE	5
SUSC22	118	OVCA	MAN	1	L		2345678			I11J9K2			SYMPHYSIS LOST AND DEC TEETH-OTHERWISE COMPLETE	4
SUSC22	120	ORC	TIB	1	R	PFDF	1234567				GL-94		COMPLETE	4
SUSC22	127	SSZ	TRV	1	F								POST BASAL PART SPINE-SL POROUS-IMM?	4
SUSC22	132	CHIK	FEM	1	L								SPLIT SHAFT-WITH SOME CALCIUM FILLING-EGGLAYING!	4
SUSC22	132	FISH	UNI	1	F								LARGE FISH-NOT IDENTIFIED	4
SUSC22	132	OVCA	MAN	1	L		123			abcfgh16 I11J7K2			HORI RAMUS WITH DP2-M2 + INCISORS- 4 PIECES	4
SUSC22	132	OVCA	SKL	1	L		09			fgh13 I11J4			MAXILLA WITH DP2-M2-SAME HEAD AS ABOVE-SKULL & MANDIBLE!	3
SUSC22	144	BOS	RIB	1	F			CH					DISTAL MIDSHAFT FRAGMENT-DISTAL END CHOPPED	4
SUSC22	144	BOS	RIB	1	R								MOST OF SHAFT-BOTH ENDS BROKEN	4
SUSC22	147	BOS	AST	1	L		1	CH	DG		L1-59 L2-55.8 Bp-40.4 Bd-37.9 Dd-27.3		COMPLETE-DISTAL CHEWED AND CHOPPED MEDIO-LATERALY	4
SUSC22	147	EQU	ULN	1	R		23	CH	DG				SEMILUNARIS AND PART OLECRANON-	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	path.	comment	preserv-ation
													PROX END CHEWED-CHOPPED AT ARTIC	
SUSC22	147	OVI	MTT	1	L	DF	12345				GL-128 Bp-19.3 Dp-19.8 SD-11.4 Bd-23.3 Dd-14.8		COMPLETE-GRACILE-HIGH WAIST	4

Appendix 4

SITE MATRIX



Appendix 5

GLOSSARY

Context An archaeological context represents a distinct archaeological event or process. For example, the action of digging a pit creates a context (the cut) as does the process of its subsequent backfill (the fill). Each context encountered during an archaeological investigation is allocated a unique number by the archaeologist and a record sheet detailing the description and interpretation of the context (the context sheet) is created and placed in the site archive. Context numbers are identified within the report text by brackets, *e.g.* [004].

Cut A cut refers to the physical action of digging a posthole, pit, ditch, foundation trench, *etc*. Once the fills of these features are removed during an archaeological investigation the original 'cut' is therefore exposed and subsequently recorded.

Fill Once a feature has been dug it begins to silt up (either slowly or rapidly) or it can be back-filled manually. The soil(s) that become contained by the 'cut' are referred to as its fill(s).

Intrusive Artefacts of later date found in deposits that must pre-date them are said to be intrusive. Such intrusive artefacts will usually be small and have worked down in the soil through cracks, or by root, worm or rodent action. Intrusive artefacts will generally be isolated and be distinctively later than a larger assemblage of earlier artefacts, for example, a single 19th century pottery fragment found in a large collection of medieval ceramics in a refuse pit.

Layer A layer is an accumulation of soil or other material that is not contained within a cut

Medieval The Middle Ages, dating from approximately AD 1066-1500.

Natural Undisturbed deposit(s) of soil or rock which have accumulated without the influence of human activity

Post-medieval The period following the Middle Ages, dating from approximately AD 1500-1800.

Romano-British Pertaining to the period dating from AD 43-410 when the Romans occupied Britain.

Saltern Salt making site where salt is obtained from sea water through evaporation.

Saxo-Norman Pertaining to the period either side of the Norman Conquest of 1066, dating from about 1000-1100 AD.

Appendix 6

THE ARCHIVE

The archive consists of:

2 Trench sheets
152 Context record sheets
43 Sheets of scale drawings (17 sections, 10 Trench A and 10 Trench B sections, 6 plans)
8 Context register sheets
2 Photographic record sheets
2 Section record sheets
1 Plan record sheet
1 Small finds record sheet
52 Daily record sheets

All primary records are currently kept at:

Archaeological Project Services
The Old School
Cameron Street
Heckington
Sleaford
Lincolnshire
NG34 9RW

The ultimate destination of the project archive is:

Lincolnshire City and County Museum
The Collection
Danes Terrace
Lincoln
LN2 1LP

Accession Number: LCNCC: 2022.1

Archaeological Project Services Site Code: SUSC22

OASIS Record No: Archaeol1-510997

The discussion and comments provided in this report are based on the archaeology revealed during the site investigations. Other archaeological finds and features may exist on the development site but away from the areas exposed during the course of this fieldwork. *Archaeological Project Services* cannot confirm that those areas unexposed are free from archaeology nor that any archaeology present there is of a similar character to that revealed during the current investigation.

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Summary for archaeol1-510997

OASIS ID (UID)	archaeol1-510997
Project Name	Archaeological Investigation of Land off Sunnydale Close, Surfleet, Lincolnshire, United Kingdom
Sitename	Sunnydale Close, Surfleet CP, Lincolnshire, United Kingdom
Activity type	Open Area Excavation
Project Identifier(s)	Archaeological Investigation of Land off Surfleet Sunnydale Close
Planning Id	H17-1187-21
Reason For Investigation	Planning: Between application and determination
Organisation Responsible for work	Archaeological Project Services
Project Dates	08-Feb-2022 - 13-May-2022
Location	Sunnydale Close, Surfleet CP, Lincolnshire, United Kingdom NGR : TF 25137 27835 LL : 52.833514939523, -0.143898501992226 12 Fig : 525137,327835
Administrative Areas	Country : England County : Lincolnshire District : South Holland Parish : Surfleet
Project Methodology	"Strip, map and sample" investigation.
Project Results	The excavation revealed a 13th-14th century, large waste mound associated with salt-production activities, assuming further remains such as filtration units and hearths to be discovered in close proximity. Archaeological features surrounding the mound were identified as waste pits and a possible freshwater ditch. The recovered finds consist of domestic pottery sherds of predominantly 10th-14th century date and substantial amount of animal bone fragments of large-size species.
Keywords	Saltern - MEDIEVAL - FISH Thesaurus of Monument Types
Funder	
HER	Lincolnshire HER - unRev - STANDARD
Person Responsible for work	Peter, Tovizi
HER Identifiers	
Archives	Physical Archive, Documentary Archive, Digital Archive - to be deposited with The Collection: Art and Archaeology in Lincolnshire;