place on the site, full recording of the ceramic building material by a specialist should take place to maximise its usefulness to both the site, and to the study of the material and its substantial industry in a broader context.

12.1.4 Evaluation Context Listing

Context	Form	Thickness (mm)	Comments	Spot date
0	FLUE	16	TRENCH 3 U/S; COMBED	2ND-4TH
0	IMBREX	0	TRENCH 4 U/S; BURNT	ROMAN
0	RBRICK	0	TRENCH 2 U/S; SMALL FRAG	ROMAN
	RBRICK	21	TRENCH 2 U/S; ABRADED	
2000	IMBREX	0	ABRADED	
	RBRICK	28	TEGULA?; KEYING?; 'V' SIGNATURE?	
2002	DAUB	0		ROMAN
	FLUE	16		
	FLUE	19		
	RBRICK	0	X 4 FRAGS	
	RBRICK	18		
	RBRICK	20		
	RBRICK	21		
	RBRICK	26		
	RBRICK	31	PAWPRINT - DOG	
	RBRICK	50	BURNT?	
	RBRICK	52	LARGE FRAGMENT; ABRADED	
	RBRICK	55	ABRADED	
	TEGULA	23	ABRADED	
2012	RBRICK	16		ROMAN
	RBRICK	22		
	TEGULA	22	ABRADED	
3000	RBRICK	18		ROMAN
	TEGULA	0		
	TEGULA	22	SOFT FABRIC	
	TEGULA	23		
3001	TEGULA	19		ROMAN
	TEGULA	19	LOWER CUTAWAY; ABRADED; X 3 JOINING FRAGS	
3009	FLUE	19	VENT	ROMAN
	IMBREX	17		
	RBRICK	15		
3011	RBRICK	26		ROMAN
3014	RBRICK	0		ROMAN
	RBRICK	17		
3016	IMBREX	15		ROMAN
	IMBREX	18		
	RBRICK	0		
	TEGULA	0	ABRADED; BURNT	
3018	RBRICK	17		ROMAN
	RBRICK	19		
	RBRICK	34		
	TEGULA	18		
	TEGULA	19	1 ARC SIGNATURE; LOWER CUTAWAY	
	TEGULA	19	UPPER CUTAWAY	
	TEGULA	21	LOWER CUTAWAY	

Context	Form	Thickness (mm)	Comments	Spot date
4001	IMBREX	15		ROMAN
	IMBREX	16		
	IMBREX	18		
	IMBREX	24		
	IMBREX	24		
	IMBREX?	13	POSS MODERN	
	LIMESTONE	26	LUMP	
	OPSIG	0	TRACES RED PAINT; TURNED EDGE	
	PAINTED PLASTER	0	BROWN, WITH STRIPES	
	PAINTED PLASTER	0	GREY, PAINTED OVER RED	
	PAINTED PLASTER	0	PINK; ROUGH SURFACE	
	PAINTED PLASTER	0	RED	
	PAINTED PLASTER	0	WHITE	
	PAINTED PLASTER	0	WHITE; CURVED, PERHAPS TO GO ROUND PILLAR	
	RBRICK	0	ABRADED; MORTAR; SMOOTHED AND/OR TRIMMED	
	RBRICK	0	X 5 FRAGS	
	RBRICK	17		
	RBRICK	18		
	RBRICK	22		
	RBRICK	29	ABRADED; BURNT REUSED	
	RBRICK	35		
	TEGULA	0	FRAG	
4003	RBRICK	0	ABRADED	ROMAN
4005	DRAIN	13		19TH-20TH
	FLUE	19	COMBED; SOOTED (2ND-4TH)	
	IMBREX	13	X 2 FRAGS	
	IMBREX	14		
	OPSIG	0		
	OPSIG	0	ATTACHED TO STONE BLOCK	
	OPSIG	0	SHOWS AT LEAST TWO LAYERS	
	RBRICK	30	OP SIG; REUSED	
	RBRICK	35	REUSED; OP SIG; CORNER	
	RBRICK	38		
4006	RBRICK	45	REUSED; MORTAR; BURNT	ROMAN
4008	FLUE	16		ROMAN
	IMBREX	14		
	LIMESTONE	0	BALL	
	OPSIG	0		
	RBRICK	18		
	RBRICK	22		
	RBRICK	27		
	RBRICK	35	CORNER	
	RBRICK	41		
	SANDSTONE	9	FINE GRAINED; ROOFING?	
4009	FLUE	15	VENT; VENT EDGE 84MM FROM EDGE OF FLUE	ROMAN
	IMBREX	17		
	IMBREX	18	RIDGE; BEGINNING OF CHIMNEY, OR FINIAL?	
	IMBREX	21		
	RBRICK	17	X 2 FRAGS	
	RBRICK	20		
	RBRICK	24		

Context	Form	Thickness (mm)	Comments	Spot date
	TEGULA	20	X 2 JOINING FRAGS	
5000	COBBLE	0		ROMAN
	DAUB	0	X 6 FRAGS	
	FLUE	13		
	FLUE	15		
	FLUE	17	PALE FABRIC; ALMOST TUBULAR SHAPE	
	FLUE	17	VENT	
	FLUE?	16		
	FLUE?	17		
	FLUE?	18		
	IMBREX	20		
	LIMESTONE	0		
	RBRICK	0	ABRADED	
	RBRICK	0	X 2 FRAGS	
	RBRICK	25	SIGNATURE	
	RBRICK	28	PAWPRINT - CAT?	
	RBRICK	30	FINE FABRIC	
	RBRICK	33		
	RBRICK	39		
	RBRICK	42	SIGNATURE	
	SANDSTONE	0	FINE GRAINED	
	TEGULA	0	LOWER CUTAWAY	
	TEGULA	0	NO FLANGE	
5006	RBRICK	0	X 3 FRAGS	ROMAN
5013	FLUE	16		ROMAN
	FLUE	20	SOOTED; VENT	
	FLUE	25	VENT	
	IMBREX	13		
	IMBREX	15		
	IMBREX	16		
	IMBREX	16		
	IMBREX	18	X 2 FRAGS	
	IMBREX	19		
	LIMESTONE	0	BURNT?	
	RBRICK	0	14 FRAGS	
	RBRICK	17	TEGULA?	
	RBRICK	22		
	RBRICK	23		
	RBRICK	26		
	RBRICK	26		
	RBRICK	28		
	RBRICK	31		
	RBRICK	40		
	TEGULA	23		
5014	RBRICK	0	X 2 FRAGS	ROMAN
5015	FLUE	12	COMBED; VENT	2ND-4TH
	RBRICK	16	BURNT ON EDGES	
5016	RBRICK	17	BURNT	ROMAN

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12.2 Excavation

12.2.1 Introduction

Five standard boxes of ceramic building materials were submitted for examination. The material was mostly Roman in date, with a few contexts containing medieval and post medieval fragments.

12.2.2 Roman material

Roman material comprises roofing tile (tegula and imbrex), material often associated with hypocausts (flue tile and brick) and daub.

The tegulae range in thickness from 15-35mm. The example of the 35mm tegula (context [6232]) shows clear signs of the flange having been deliberately removed as the flange scar is worn. It has been reused, and the size hints that it might have been scavenged from elsewhere, or is perhaps part of an earlier or later building phase than the majority of tiles in the sample. The flange heights fall between 33-55mm. In comparison to the military base of York, both thickness and flange heights are much smaller. Where identifiable, lower cutaways conform to Betts' type B (Betts 1985). The majority of the flange profiles are noticeably square in profile.

Imbrice thickness measurements range from 14-23mm. Again these are smaller than the military products of York.

The flue tile have a thickness of between 13-23mm. Particular characteristics are rounded corners, the occasional sanded outer surface, and combed keying. Elsewhere, the combed keying is associated with a 2nd century or later date. There are signs of rectangular vents. In one case (context [6260]) there is possibly a circular vent, however the identification of this fragment is uncertain. Some examples have sooting on the inner surface confirming usage in a hypocaust.

Some of the brick fragments might be pila tile which was used in the hypocaust pillars, but also might have been used in wall courses as well. Some of the pieces identified might be from tegula, but the fragments are too small for certain identification, and they may have been reused in walling subsequently. One such fragment is a piece from context [6262]. Its thickness falls easily within that of tegula, but it has a 'pie-crusted' edge. Whether this was deliberate decoration, or the idle whim of the tile maker is uncertain. It only occurs on one fragment from this sample. There is a smudged dog paw print on a brick from context [6217].

Sooting on surfaces of the ceramic building material appears quite often. As with flue tile, sometimes the sooting appears on (inner) surfaces that might well be part of the tile's function. However, on several occasions the sooting occurs on broken edges in the Roman period (e.g. contexts [6142] and [6088]). This implies that there was an unintentional fire at the building.

Some of the fabrics are probably from the York area, however there are others that are not so familiar. In particular, there is a fabric that fires to a pale colour

12.2.3 Medieval and Post medieval material

Medieval material consists of medieval or later plain roofing tile, a few fragments of brick, and land drain fragments.

12.2.4 Other items

There were three small fragments of daub from context [6205]. These may have come from a less substantial building than that of the building with the roof tile and hypocaust. It might also come from an oven or a hearth.

There was an assortment of stone. There is a large fragment of stone from context [6000] which might be from a quern. Two of the surfaces are worn. It should be looked at by a stone and quern specialist. There were other small fragments of degraded limestone and fine grained sandstone.

12.2.5 Conclusion

The ceramic building materials point heavily toward a substantial building with a tiled roof and a hypocaust. The building was possibly burnt down at some stage. A few of the Roman bricks are worn, and this may hint at reuse.

This sample must be retained for further study, at which point it should be fully recorded by a recognised ceramic building materials specialist. The fabrics and forms could be compared with CBM from York and Malton. Since the site is between these two Roman towns, it will be useful to gauge if any of the material travelled from either of these places. The measurements of the roof tile do not fit in with the military material from York. This may be pointing to a specifically civilian tile industry, or a later date of manufacture when the tiles had become smaller. Full consideration of the stratigraphic data could be taken into consideration so that the role of CBM from the site can be more fully understood.

12.2.6 Reference

Betts I M, 1985. *A Scientific investigation of the brick and tile industry of York to the mid-eighteenth century.* Bradford University (unpublished PhD thesis)

12.2.7 *Excavation Context Listing*

Cxt	Form	Bre	Thi	Flange Height	Comments	Date range	Spot date
6000	Flue	125	18		Plain face	Roman	19th+
	Flue?		20		Smoothed	Roman	
	Imbrex		14			Roman	
	Imbrex		14		Burnt on broken edge	Roman	
	Imbrex		22			Roman	
	Land drain		13		2 x frags	19th+	
	Stone				Fragment of Quernstone? Worn surfaces		
	Tegula		15	36	Lower cutaway?	Roman	
	Tegula		18	41	Lower cutaway B	Roman	
6011	Land drain				32 x small-mediums frags, possibly horseshore drains with sole plates	e19th	e19th+
6056	Stone				Fine grained sandstone, burnt	?	?
6058	Rbrick				1 x small frag	Roman	Roman
	Rbrick		21			Roman	
6068	Flue		16			Roman	Roman
6075	Imbrex		13			Roman	Roman
	Imbrex		15			Roman	
	Imbrex		16			Roman	
	Imbrex		19			Roman	
	Rbrick				1 x medium frag	Roman	
	Tegula		15	37	Rough upper cutaway	Roman	
6088	Flue		17		Sooted on broken edge, rounded corners	Roman	Roman
	Rbrick		15		Hard fabric	Roman	
6090	Flue?		16		Sooted inner surface	Roman	Roman
	Imbrex		15			Roman	
	Imbrex		16			Roman	
	Imbrex		18			Roman	
	Imbrex		20			Roman	
	Imbrex		20			Roman	
	Imbrex		22			Roman	
	Rbrick				2 x small frags	Roman	
	Rbrick		25			Roman	
6092	Rbrick		13		Possibly flue tile	Roman	Roman
6095	Rbrick		14			Roman	Roman
6114	Brick?					M/PM	M/PM?
	Flue		22		Combed	2-4th	
	Rbrick				3 x small frags	Roman	
	Rbrick				3 x small frags	Roman	
	Rbrick		17			Roman	
	Rbrick		20			Roman	
6132	Flue				Combed	2-4th	2-4th
	Flue		18			Roman	
	Flue		23		Combed	2-4th	
	Imbrex		19			Roman	
	Rbrick		39*			Roman	
	Tegula			36	Abraded	Roman	

Cxt	Form	Bre	Thi	Flange Height	Comments	Date range	Spot date
6142	Imbrex		18			Roman	Roman
	Tegula		22	39		Roman	
	Tegula		23	39	Sooted on broken edge	Roman	
6143	Stone				Soft, degraded	?	?
6147	Imbrex		14			Roman	Roman
	Rbrick				4 x small frags	Roman	
6161	Imbrex		15			Roman	Roman
	Rbrick		35			Roman	
	Rbrick		36			Roman	
	Stone		18		Fine grained sandstone	?	
6162	Rbrick				8 x medium frags	Roman	Roman
6170	Imbrex		21			Roman	2nd?
	Rbrick				2 x small frags	Roman	
	Rbrick				1 x small frag	Roman	
	Rbrick		31		Overfired	Roman	
	Stone				Fine grained sandstone, burnt	?	
	Tegula		17	33		Roman	
	Tegula		21	42*	Abraded flange	Roman	
6174	Imbrex		15			Roman	Roman
	Rbrick				3 x small frags	Roman	
6175	Brick					M/PM	M/PM
	Flue	99*	16			Roman	
	Rbrick				x 6 small frags	Roman	
	Rbrick		17			Roman	
	Rbrick		33			Roman	
6178	Rbrick				1 x small frag	Roman	Roman
	Rbrick		17			Roman	
	Rbrick		20			Roman	
	Tegula		20	55	Hard fabric	Roman	
6205	Daub				3 x small frags	Roman?	Roman
6217	Rbrick				20 x small/medium frags	Roman	Roman
	Rbrick		18			Roman	
	Rbrick		18			Roman	
	Rbrick		27			Roman	
	Rbrick		30		Dog? pawprint	Roman	
	Rbrick		31		2 x medium frags	Roman	
	Tegula					Roman	
	Tegula		25	42		Roman	
6218	Flue				Sooted inner surface, corner, vent (rectangular)	Roman	Roman
	Flue		15		Corner, sooted inner surface	Roman	
	Flue		16		Corner	Roman	
	Flue		17		Corner, pale fabric	Roman	
	Flue		18		Sooted inner surface	Roman	
	Flue		18		Corner, pale fabric	Roman	
	Flue		18		Corner	Roman	
	Flue		18		Corner, vent (rectangular)	Roman	
	Imbrex		15			Roman	
	Rbrick				3 x small frags	Roman	
	Rbrick		13			Roman	

Cxt	Form	Bre	Thi	Flange Height	Comments	Date range	Spot date
	Rbrick		23		Worn	Roman	
	Rbrick		30			Roman	
6225	Rbrick				1 x small frags	Roman	Roman
	Rbrick		32		Pale fabric	Roman	
6226	Rbrick				25 x medium frags	Roman	Roman
	Rbrick		16			Roman	
6228	Rbrick					Roman	Roman
6232	Flue		15			Roman	2-4th
	Flue		18		Combed	2-4th	
	Imbrex		16		Silty fabric	Roman	
	Imbrex		18			Roman	
	Imbrex		19			Roman	
	Imbrex		21		Abraded/frost cracked	Roman	
	Rbrick				9 x small-medium frags	Roman	
	Rbrick		16		Silty fabric	Roman	
	Rbrick		20			Roman	
	Rbrick		21			Roman	
	Rbrick		28		Corner frag	Roman	
	Rbrick		34			Roman	
	Rbrick		37		Corner	Roman	
	Tegula		23	40		Roman	
	Tegula		25	45		Roman	
	Tegula		35		Flange removed	Roman	
6236	Rbrick				3 x small frags	Roman	Roman
6237	Imbrex		13		Abraded, frost cracked	Roman	Roman
6253	Flue				Vent (rectangular), rounded corner	Roman	Med?
	Flue				Vent	Roman	
	Flue		13		Vent (rectangular), rounded corner	Roman	
	Flue		14		Sanded outer surface (finger smoothed), vent (rectangular)	Roman	
	Imbrex		17			Roman	
	Plain?		13			Med?	
	Plain?		16			Med?	
	Rbrick				5 x small frags	Roman	
	Rbrick		15			Roman	
	Rbrick		19			Roman	
	Rbrick		26			Roman	
6258	Rbrick				?Burnt	Roman	Roman
6260	Flue		14		Combed, rounded corners, vent at least 100mm long	2-4th	2-4th
	Flue		16			Roman	
	Flue		18			Roman	
	Flue		19		Vent (rectangular)	Roman	
	Flue?				Circular vent?/Imbrex with vent?	Roman	
	Rbrick				1 x small frag	Roman	
	Rbrick				14 x small frags	Roman	
	Rbrick		16			Roman	
	Rbrick		20			Roman	
	Rbrick		21		2 x frags	Roman	
	Rbrick		21			Roman	

Cxt	Form	Bre	Thi	Flange Height	Comments	Date range	Spot date
	Rbrick		22			Roman	
	Rbrick		23			Roman	
	Rbrick		32			Roman	
	Rbrick		34			Roman	
	Rbrick		37			Roman	
	Tegula				Abraded	Roman	
	Tegula		18		Upper cutaway, sooted on base	Roman	
	Tegula		19	38		Roman	
	Tegula		22	42		Roman	
6261	Flue		19		Combed, sooted inner surface	2-4th	2-4th
	Rbrick				Burnt edge	Roman	
6262	Rbrick		20		2 x frags	Roman	Roman
	Rbrick		21		Pie crust edge. Decoration?	Roman	
	Rbrick		28			Roman	
6272	Imbrex		14			Roman	Roman
	Imbrex		18			Roman	
	Imbrex		20			Roman	
6274	Stone				Degraded limestone?	?	?
6289	Rbrick		36			Roman	Roman
6291	Imbrex		11			Roman	Roman
	Imbrex		14			Roman	
	Imbrex		15			Roman	
	Rbrick		18			Roman	
	Rbrick		20			Roman	
	Rbrick		33			Roman	
6293	Flue		20			Roman	Roman
	Imbrex		17			Roman	
	Rbrick				8 x small frags	Roman	
	Rbrick		18		2 x frags	Roman	
	Rbrick		31			Roman	
	Rbrick		33			Roman	
	Rbrick		35			Roman	
	Tegula		23			Roman	
6294	Imbrex		17			Roman	Roman
	Imbrex		19			Roman	
	Rbrick				x 4 small frags	Roman	
	Rbrick		18			Roman	
	Rbrick		22			Roman	
	Rbrick		33		Corner fragment, sooted	Roman	
	Tegula		23	42		Roman	
6300	Imbrex		14			Roman	Roman
	Imbrex		16			Roman	
	Imbrex		17			Roman	
	Imbrex		17		3 x small frags	Roman	
	Imbrex		23			Roman	
	Rbrick		33			Roman	
	Rbrick		34		2 x frags	Roman	
	Rbrick		37		Corner frag	Roman	
	Rbrick		38			Roman	
	Tegula		18	40	Lower cutaway B	Roman	

Cxt	Form	Bre	Thi	Flange Height	Comments	Date range	Spot date
	Tegula		19	42		Roman	
	Tegula		21		Upper cutaway	Roman	
	Tegula		21	42		Roman	
	Tegula		24	48	Lower cutaway B	Roman	
	Tegula		28	47		Roman	
6307	Imbrex		16			Roman	Roman
	Rbrick		21			Roman	
	Tegula		19	39		Roman	
6310	Imbrex		20			Roman	Roman

*Minimum measurement

M/PM = Medieval/Post medieval. Med = Medieval

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13.0 Appendix 4 ~ Registered Finds Assessment

Alan Vince & Jenny Mann

13.1 Evaluation

13.1.1 Introduction

Nineteen registered finds were submitted for analysis and conservation to Lincolnshire County Council Heritage Services Conservation Department. The non-ceramic finds from West Lilling are consistent with a Romanised settlement of moderate status.

13.1.2 Iron

A number of corroded iron objects were recovered. Most are either nails or the broken shafts of nails. Other artefacts are a D-shaped buckle (SF5b), a bill hook (SF17), a whittle-tang knife (SF18) and fragments of what might be iron sheet, or natural concretion. None of these items is independently-datable but all are of types found in the Roman period (and later).

Id	context	object	comments	x-ray plate
SF3	5014	Nail	32mm shaft, 10mm head.	BPTSEP:169.4.1999
SF4	5015	nail	Probably a heavily-corroded nail shaft.	BPTSEP:169.4.1999
SF5a	4008	nail	Nail 45mm long broken shaft with 10mm wide head.	BPTSEP:169.2.1999
SF5b	4008	buckle	Probable D-shaped buckle with iron pin.	BPTSEP:169.2.1999
SF6	5016	nail	Probable nail shaft and tip. 55mm long.	BPTSEP:169.4.1999
SF7	4001	nails	Two nails. (a) 45 mm long broken shaft, 13mm head. (b) 30mm broken shaft, 15mm head.	BPTSEP:169.2.1999
SF8	5013	nails	Two nails. (a) 70mm shaft, 18mm head (b) 47mm shaft, 9mm head.	BPTSEP:169.2.1999
SF10	4003	nails	Three nails (a) bent in centre of shaft 400mm long, 12mm head, (b) broken shaft 20mm long, 10mm head, (c) 30mm broken shaft.	BPTSEP:169.4.1999
SF11	3014	nail	Nail 45mm shaft, 15mm head.	BPTSEP:169.4.1999
SF12	5001	nail	Nail. 30mm shaft, 10mm head.	BPTSEP:169.4.1999
SF13	5001	nail	Nail. 55mm shaft, 10mm head.	BPTSEP:169.4.1999
SF14	5001	nail	Nail. 50mm broken shaft.	BPTSEP:169.4.1999
SF15	3009	nails	Two nails (a) heavily corroded, no metal shown in X-Ray, (b) 35mm broken shaft, 15mm head.	BPTSEP:169.4.1999
SF16	3016	nail	Broken shaft of nail, 55mm long.	BPTSEP:169.4.1999
SF17	5013	bill hook	Bill hook with broken? tang possibly folded back over blade. Blade 110mm long and 80mm wide.	BPTSEP:169.2.1999
SF18	Tr.3	knife	Whittle-tang knife blade. Tang 50mm long, blade 145mm long 35mm wide and 3mm thick.	BPTSEP:169.3.1999
SF20	2002	iron object	Five fragments of possible iron object. The x-rays show that no metal remains. Could either be remnants of flat iron sheeting or natural iron panning.	BPTSEP:169.1.1999

13.1.3 Lead

SF2. Unknown object constructed from a solid cylinder of lead 35mm long and 21mm diameter with flanges at either end. At one end the flange (diameter 35mm) seems to have been moulded or beaten out of the metal comprising the cylinder but at the other (diameter

33mm) it seems more likely that the flange is formed from an added strip of metal, although no sign of any seam or join is visible. There is no sign of wear on either end, nor on the central spindle. Thus, although the object superficially looks like a pulley (without a central hole) or repair plug neither function is possible.

The poor condition of the metal is consistent with a Roman date, although the object is unstratified and could be of any date up to the present day.

13.1.4 Glass

SF19 *Context 4001.* Three fragments of light green window glass, *c.*2mm thick. These fragments have the characteristic irregular surface on one side resulting from being formed from a blown cylinder of glass from which both ends were cut after blowing. This technique is characteristic of the Roman period.

SF19 *Context 4001.* One fragment of light blue ?mould blown vessel glass, 5mm thick. Probably of Roman date.

13.1.5 Copper Alloy

SF1 *Context 3011.* Shears, c.123mm long. In contrast to medieval shears from the London waterfront, the bow is not differentiated from the arms but in other respects there is little difference between these shears and the London examples, although there is no close parallel to the detail of the recesses either (Cowgill *et al* 1987, 106-113).

13.1.6 Coins

SF9 *Context 4002. X-Ray BPTSEP:169.4.1999.* Barbarous radiate. Mid 3rd century.

13.1.7 Wall Plaster

Context 4001. 23 fragments of wall plaster, some of which have a red wash and one of which has the straight junction between an area of red wash and an area of plain plaster. The plaster is of variable thickness and in one case was plastered onto wood, but in other cases the backing is unclear. The finish of the plaster is irregular with tool marks showing on many pieces and despite the use of paint it seems that the plastering is of low quality.

13.1.8 Pottery

A whole oil burning lamp was recovered from context [6090]. At the time of writing, the assessment report for this artefact is not available. The object will, however, require a brief report and illustration preparing.

13.1.9 Bibliography

Cowgill, J, de Neergaard, M & Griffiths, N 1987 *Knives and Scabbards* Medieval Finds from Excavations in London. HMSO

13.2 *Metal detecting survey*

A total of 23 artefacts were recovered during the metal detecting/walkover survey undertaken prior to the excavation commencing. These were recorded by their easting along the excavation baseline, and are listed below accordingly.

Easting	Registered Find number	Description
10.4	SF132	modern iron object
29	SF137	modern iron object
32.5	SF123	undated iron ring
35	SF135	modern iron object
37.8	SF29	modern iron nail
45.5	SF126	modern iron wire
48.4	SF134	modern iron object
53.4	SF253	probably unworked pebble
54.3	SF133	modern iron sheet
55.5	SF244	modern glass window
67.9	SF130	undated iron object, possible from a piece of furniture
89	SF25	modern milk bottle top!
89.4	SF127	modern iron object
96.5	SF125	modern iron wire
98	SF124	modern iron nail
100.4	SF136	modern iron object
104.1	SF131	modern iron nut and bolt
111.3	SF26	undated lead alloy object
135	SF38	undated copper alloy wire
148.1	SF129	undated nail/awl/punch
149.7	SF128	modern iron washer
157.1	SF30	modern gun cartridge case
165.9	SF27	modern iron nail

13.3 *Excavation*

Eighty six objects were recorded by context number during the excavation. There are no copper alloy finds, no lead alloy and no silver. The latter is not surprising, as silver is rare. However, copper alloy finds are usually common on high status Romano-British sites (such as towns, military sites and villas). It is possible that soil conditions were too corrosive for the survival of copper alloy. Furthermore, the condition of the ironwork is very poor, with some artefacts being represented by a nodule of corrosion with a void where the iron object once was. By contrast, the glass is in good condition.

copper	glass	iron	lead	silver	stone
0	5	68	0	0	9

13.3.1 *Glass*

There are five pieces of glass. One (SF20) is from a moulded bottle, and probably modern in date (it was found in the ploughsoil). Three are fragments of window glass, of which one (SF21) is a piece of cast window glass, with one glossy and one matt surface. This feature is

typical of 1st to 3rd century Roman window glass and indicates the presence of a Romanised building nearby. Two (SF22 and SF24) are thinner and have air bubbles within them. These are probably late Roman blown window glass. A final fragment has a slight lip to one edge and might be from a late Roman bottle (SF23).

id	context	interpretation	object	comments
20	6000	Ploughsoil	BOT	Modern
21	6075	Fill of [6074]	WIND	1st-3rd century
22	6090	Fill of [6089]	WIND	Late Roman
23	6217	Fill of [6233]	WIND	Roman vessel
24	6260	silting covering road surface	WIND	Late Roman

13.3.2 Iron

There are sixty-eight pieces of iron or iron corrosion from the excavation. All are either nails, possible nails, slag or completely corroded lumps. There is a concentration in cobble layer [6142] but otherwise the finds appear to be evenly distributed within the Romano-British strata. It might be, however, that a plot of the finds would reveal patterning. Only 13 nails are complete. This is too small a sample for statistical analysis of nail dimensions. The presence of possible slag fragments indicates that some metalworking may have taken place on the site in the Roman period. Given the late Roman/early Anglo-Saxon date of the site, it is important to clarify this and it is recommended that the entire iron assemblage is examined by a specialist in archaeological metalworking (Jane Cowgill is recommended).

context	type	interpretation	object	comments	x-ray plate
6000	Layer	Ploughsoil	nail	complete	12
6074	Cut	Cut of large ditch	nail		12
6075	Fill	Fill of [6074]	nail	complete	9
6090	Fill	Fill of [6089]	-	no metal showing in xray;probably completely corroded object	9
6090	Fill	Fill of [6089]	nail	complete	9
6090	Fill	Fill of [6089]	nail?	shaft?;jm - just possibly awl/punch	9
6094	Fill	Fill of [6093]	slag		11
6114	Fill	Fill of [	slag		11
6114	Fill	Fill of [	slag	cinder?	11
6114	Fill	Fill of [	nail	complete	9
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail?	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail?	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail?	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail		8
6142	Layer	Cobble layer	nail	round head	9
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8

context	type	interpretation	object	comments	x-ray plate
6142	Layer	Cobble layer	nail		9
6142	Layer	Cobble layer	nail?	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail		8
6142	Layer	Cobble layer	nail?		8
6142	Layer	Cobble layer	nail		8
6142	Layer	Cobble layer	nail?		8
6142	Layer	Cobble layer	nail		9
6142	Layer	Cobble layer	nail?	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail	complete	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	nail	complete	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6142	Layer	Cobble layer	-	no metal showing in xray;probably completely corroded object;poss nail?	8
6161	Fill	Fill of [6160]	nail		9
6161	Fill	Fill of [6160]	nail?	shaft/curved spike	9
6161	Fill	Fill of [6160]	nail	shaft, bent at 90 degrees	9
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail		10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail	complete;surrounded by rust nodule	10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail		10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail?	shaft bent 90 degrees	10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail		10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail	complete	11
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151		no metal showing in xray;might be completely corroded object or rust	10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail?		10
6170	Fill	Fill of [6171]v. similar to upper fill of ditch 6151	nail		10
6174	Fill	Fill of [6176]	slag		11
6175	Fill	Fill of [6176]	nail	bent	12
6175	Fill	Fill of [6176]	nail	head only	12
6194	Fill	Fill of [6195]	object?	poss corroded object	11
6213	Fill	Fill of [6214]	slag		12
6217	Fill	Fill of [6233]	nail	complete	12
6221	Fill	Fill of [6224] cut by modern land drain	object?	x6 frags;poss corroded object	11
6225	Layer	layer similar to 6251,6249	nail	shaft only	8
6226	Fill	Fill of [6282]	nail	shaft only	8
6236	Layer		nail	complete	9
6236	Layer		nail	complete	9
6260	Layer	silting covering road surface	nail	circular sectioned;hollow or centrally-voided	9

context	type	interpretation	object	comments	x-ray plate
				fragment - jm	
6260	Layer	silting covering road surface	nail		9
6261	Layer	layer on which road was laid- very silty it is possible that the droveway was silting up/ becoming unusable so road was built.	bar	rect-sectioned bar;binding/fitting - jm	12
6275	Fill	Fill of [6277]	nail		8
6276	Fill	Fill of [6243]	slag		12
6293	Layer		object?	poss corroded object	12
6294	Layer	A layer probably containing parts of fills 6301 & 6297 which it overlies	nail		9
6310	Fill	charcoal rich layer	object?	poss corroded object	12
6311	Fill	Fill of [6312]	slag	or ore	11

The slag should be examined by a specialist to determine whether metalworking was indeed carried out on or near the site. A survey of the x-ray plates for the iron finds did not show the presence of hammer scale and some of the pieces identified on site as 'slag' are definitely natural concretions.

13.3.3 Stone

Nine stone objects were recorded in the excavation. One of these is an unworked fossil sponge, probably accidentally present on the site rather than being selected by man. A fragment of possible honestone (SF14) is a white medium-grained sandstone pebble, of a type probably present in local boulder clay and fluvio-glacial deposits. There is no definite evidence for wear. A flake of 'greenstone' polished axe is of prehistoric date. It too may be a chance discovery although there is evidence that prehistoric axes were used as talismans in the Romano-British period. It is of intrinsic interest and should be identified by a stone petrologist (Dr R Ixer is recommended). A chert core (SF16) is probably of earlier prehistoric date (Mesolithic or Neolithic) and probably a chance discovery in a Romano-British context. The chert is fossiliferous and could probably be provenanced. It has some iron staining on the edges and may therefore have been (re)-used as a strike-a-light. Small fragments of Mayen lava quern were found in two deposits, [6114] and [6142] (SF110 and 111). They may all come from the same quernstone. Finally, two fragments of unworked jet were found in context [6194] (SF19) and a third fragment in context [6001] (SF233) and a jet bead was found in context [6236]. The bead is broken but was drilled with at least two narrow-diameter holes and is decorated with an incised cross. This therefore ought to be illustrated and the subject of a specialist report.

id	context	interpretation	object	comments
208	6000	Ploughsoil		fossil sponge?; replaced by haematite
14	6000	Ploughsoil	hone	white fine-grained sandstone; might be unworked pebble
15	6016	Fill of [6017]	axe	flake of polished axe
16	6094	Fill of [6093]	core	fossiliferous chert core
110	6114	Fill of [	quern	lava; lump
111	6142	Cobble layer	quern	lava;x3 lumps
19	6194	Fill of [6195]	waste	unworked(?) jet lumps;x2

17	6226	Fill of [6282]	-	unworked pebble?;poss burnt;iron staining
18	6236		bead	jet bead;broken in half;rect with incised dec
233	6001		waste	roughly cubic fragment of jet

13.3.4 Ceramic

Two counters were found. One of these was produced by hand moulding a lump of clay into an oval 'pancake' (SF231) and the other produced from a sherd of Romano-British pottery (CALC). The survival of a marking-out point and the general shape of this counter shows that it was marked out with a pair of compasses. Both of these counters should be drawn and a catalogue entry produced.

id	context	interpretation	object	comments
231	6253	layer overlying fills 6241+6242+6276	counter	roughly oval, crudely handformed;oxidized
232	6260	silting covering road surface	counter	cut from calc base sherd;marking-out point shows that it was drawn with compasses

14.0 Appendix 5 ~ Lithics Assessment (see also 13.3.3, above)

Antony Dickson

14.1 Introduction

A total of six lithics were submitted from the excavation at West Lilling, undertaken by On-Site Archaeology on behalf of BP Chemicals Limited. All the flakes were made on flint, which varied in colour from brown to brownish green, and bluish grey to greyish white. Of the six artefacts four were unmodified flakes, whilst one exhibited evidence for retouch and a further flake had been ground and polished. Due to the small size of the assemblage no relative date can be inferred from technological characteristics, suffice to say that they probably fall into a broad date range spanning the Neolithic.

14.2 Aims and Objectives

The aims of the assessment were:

- To identify all the material by context
- To provide a brief discussion of the artefact's technological attributes
- To provide a date range for the assemblage
- To recommend and justify any further necessary analysis

14.3 Results

Context [6162]:

- 1 unmodified flake made on light greyish white flint
- 1 broken, edge ground and polished knife made on mid greenish brown flint

Context [6184]:

- 1 broken unmodified blade made on mid greenish brown flint
- 1 retouched flake: a form of blunted back knife made on dark greenish brown flint

Context [6274]:

- 1 broken unmodified flake made on mid bluish grey flint

Unstratified:

- 1 unmodified flake made on mid brownish green flint

14.4 Discussion

14.4.1 Context [6162]

The unmodified flake is probably made on chalk flint, presumably from the Wolds, although the texture of the crystalline make up of the body of the flake appears coarse and considerably opaque. With these considerations in mind it is possible that the flake may be made on chert. The flake was removed during the secondary phase of the reduction sequence, exhibiting a number of earlier flake removals on the dorsal face and a small amount of cortex. A narrow portion of the striking platform is present associated with a diffuse bulb of percussion. There is no direct evidence for use of the flake and in this respect the artefact probably represents a waste flake produced during core trimming activity.

The edge ground knife is made on till flint that is mid greenish brown in colour and in its raw state could have been derived from till deposits to the east of the Wolds. Manby (1974) has suggested a fairly detailed typology into which this example fits his Type III category. These artefacts are often found as surface finds, but are also known from burials, pits and as elements within stone hoards. Furthermore the artefact could have been made on flakes from a specialised core inferring specialisation in tool manufacture (Edmonds 1995). Unfortunately, the artefact is broken, but nevertheless both the edges are ground and the distal face also has been ground and polished. The ventral face has the remains of a diffuse bulb of percussion, but an attempt to remove this has been undertaken through pressure flaking. The artefact has been damaged at the proximal end of the flake, on the dorsal face, and has been snapped or broken somewhat lower removing the distal end of the flake.

14.4.2 Context [6184]

The broken blade is made on till flint that is mid greenish brown in colour and in its raw state could have been derived from tills to the east of the Wolds. The blade was removed during the tertiary phase of the reduction sequence exhibiting a number of earlier opposed flake removals on the dorsal face. A very small portion of the platform is present along with a flat bulb of percussion. There is slight evidence for the use of the blade in the form of a very fine edge gloss.

The blunted back knife is made on till flint, which is dark greenish brown in colour and in its raw state could have been derived from tills to the east of the Wolds. The flake is roughly D shaped in outline and in section is wedge shaped with an acute angle of retouch on both faces of the flake forming the cutting edge. The ventral face of the flake exhibits well striated, conchoidal fracture scars and the bulb of percussion has been removed by pressure flaking. The left-hand edge of the ventral face has been retouched all the way around the edge. The dorsal face retained 70 % of a fine cortex covering and the distal end exhibits pressure flaking around the edge, which extends to a midpoint along the long edge of the flake. There is slight evidence of wearing on the edge on the ventral face, but other than this the artefact does not appear to have been used intensively.

14.4.3 Context [6274]

The broken flake is made on Chalk flint, presumably from the Wolds to the east, and is mid bluish grey in colour. The flake was removed during the secondary phase of the reduction sequence, as a small amount of cortex remains on the dorsal face. The flake is broad and thick and displays a number of parallel flake scars on the dorsal face. Taken together this information indicates that the flake may have been removed to facilitate core rejuvenation, but could just as probably be an accident of debitage. The flake is broken at the proximal and distal end and there is no evidence indicating use.

14.4.4 Unstratified

The broken flake is made on till flint and is mid brownish green in colour. The flake was removed during the tertiary phase of the reduction sequence, exhibiting two earlier flake removals on the dorsal face. A large portion of the platform is present along with a pronounced bulb of percussion. There is no evidence for the direct use of the flake.

14.4.5 Date Range

Due to the small size of the assemblage it is difficult to infer a detailed date range for the material. For example the broken blade from context [6184] and the broken flake from context [6274] display technological attributes reminiscent of knapping practices from the Early Neolithic. Additionally, artefacts like the blunted back knife from context [6184] are often found in flint industries with middle to late Neolithic affinities. Similarly, the edge ground knife from context [6162] fits into a Late Neolithic date. The two remaining flakes, although small in form and dimension, could be attributed to both Early and Later Neolithic industries.

14.5 Recommendations

The overall small size of the assemblage, and its distribution throughout a number of contexts, implies that further detailed analytical work would reveal little information concerning the technological characteristics employed during the manufacture of the lithic artefacts. Thus further interpretation pertaining to such site-specific questions as dating, defining the character of the site and the nature of occupation would be extremely limited in detail. Also, it is unclear at the time of writing as to whether the artefacts were residual or not, which would of course have ramifications regarding the definite need of further analytical work. However the fact that the assemblage contained two diagnostic tools, one of which was an edge ground knife, merits a standard procedure of recording and scale drawings to be undertaken.

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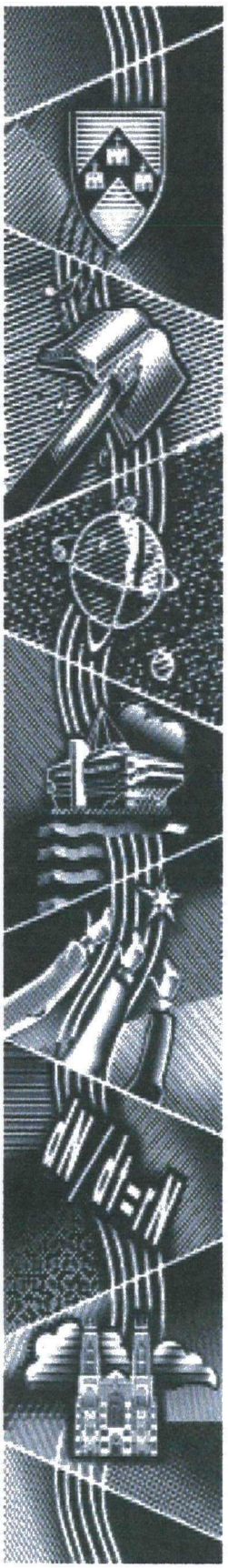
15.0 Appendix 6 ~ Environmental Samples & Hand Collected Bone Assessment



Cluny Johnstone, John Carrott, Allan Hall and Harry Kenward

Evaluation of biological remains from an evaluation near West Lilling, North Yorkshire (site code: OSA99EV02)

by

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Report No ???

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KEYWORDS: BP PIPELINE SITE 169; WEST LILLING; NORTH YORKSHIRE; ROMANO-BRITISH; VERTEBRATE REMAINS; PLANT REMAINS; INVERTEBRATE REMAINS; ASSESSMENT

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15.1 Summary (evaluation phase)

Two sediment samples and a single box of bone were submitted for assessment of their bioarchaeological potential. Sample 1 (Context [5005]) contained a small amount of charred cereal grains and charcoal. The plant and invertebrate remains from Context [2025] (Sample 2) were consistent with the archaeological interpretation of a ditch fill, but also indicated the potential for exploring aspects of human occupation in the vicinity. The recovery of bioarchaeological remains is very rare from a site of this type in the northern part of the Vale of York, so that further analysis of these samples, and investigation of any others from the excavations, should be undertaken.

The small vertebrate assemblage (61 fragments in total) was rather poorly preserved and contained the remains of domestic mammals (horse, pig and cattle) and a single bird fragment. No further work is recommended on this material.

15.2 Introduction

An evaluation excavation was undertaken by On-Site Archaeology, during February 1999, at Site 169 on the proposed route of BP Chemicals Ltd Teeside to Saltend ethylene pipeline. Site 169 is situated near the village of West Lilling in North Yorkshire (NGR: SE 640 644). Two sediment samples and a single box of bone (approx. 10 litres) were presented for assessment. Vertebrate remains were recovered from 12 contexts, all associated with a probable 4th century AD Romano-British villa. The samples were taken from ditches possibly predating this structure.

15.3 Methods

15.3.1 *Sediment samples*

The material was initially inspected in the laboratory and described using a standard *pro forma*. A 1 kg 'voucher' of each sample was removed prior to the rest of the sediment being sieved to 300 m, the washover also being sieved to 300 m. Subsequently, the <4mm fraction of the residue from Sample 2 (Context [2025]) was processed for the recovery of invertebrate remains following procedures of Kenward *et al.* (1980; 1986), the resulting flot being treated as if it had been a 'test' subsample (labelled and recorded as '/T').

All invertebrate macrofossils were recorded semi-quantitatively using the scale described by Kenward *et al.* (1986) and Kenward (1992). Records were made on a paper *pro forma* for later transfer to a computer database (using *Paradox* software) for analysis and long-term storage.

15.3.2 *Vertebrate remains*

For the vertebrate remains, data were recorded electronically directly into a series of tables using a purpose-built input system and *Paradox* software. For each context containing more

than three fragments, subjective records were made of the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Additionally, semi-quantitative information was recorded concerning fragment size, dog gnawing, burning, butchery and fresh breakage.

Where possible, fragments were identified to species or species group, using the reference collection at the Environmental Archaeology Unit, University of York. Fragments not identifiable to species were grouped into categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid), bird and completely unidentifiable.

Measurements for mammals were taken (where appropriate) according to the system of von den Driesch (1976), with additional measurements following those outlined by Dobney *et al.* (forthcoming).

Total numbers of fragments by species were recorded, together with the number of measurable fragments and isolated teeth yielding ageing or sexing information. As well as counts of fragments, total weights were recorded for all identifiable and unidentifiable categories.

15.4 Results

15.4.1 Sediment samples

Table 1 gives a list of the samples, the action taken and the retention/disposal requirements.

Trench 2, Context [2025], Sample 2/BS

Moist, dark grey-brown, crumbly (working sticky then unconsolidated), slightly sandy silty clay with fine and coarse woody and herbaceous detritus. Patches of light brown sand were present within the matrix. Wood fragments were common and twigs with bark were present.

The small washover of about 100 cm^3 was of fine herbaceous detritus with large numbers (though low concentrations, given the large subsample size) of well preserved seeds, the herbaceous detritus including many small fragments of monocotyledonous epidermis, the rest mostly brown fine roots with large cells.

The small residue of about 750 cm^3 included some narrow rods (to 150 x 15 mm) tentatively identified as *Prunus* (perhaps blackthorn, *P.spinosa* L.) with woody and herbaceous detritus quite rich in well preserved seeds. Human occupation is indicated by the presence of a few charred cereal grains (some of them extremely well preserved wheat caryopses) and a variety of weeds, and probably also by the presence of small heathland and grassland components mixed into an assemblage predominantly indicative of an intermittently wet ditch or the drying margins of a pond. Indeed, the mixture of taxa was in some ways more reminiscent of an assemblage from an urban occupation deposit than a rural one.

The large subsamples (8 kg) yielded a modest sized group of invertebrate remains, including around 50 adult beetles. These represented approximately 35 taxa, so the assemblage was diverse (i.e. mixed and derived from a range of habitats, probably from a fairly wide area). There were several individuals of a *Helophorus* species, and single individuals of five other water beetles were present, together with numerous *Daphnia* ephippia (water flea resting eggs). These suggest that the deposit was formed in water, probably not permanent.

Plant feeders were moderately common, the nine taxa probably all being derived from short herbaceous vegetation, including two indicating nettles (*Urtica* sp.). Three species of dung beetles (two *Aphodius* and a *Geotrupes*, probably totalling several individuals) suggest the possibility that there was grazing land.

There were no species strongly associated with human occupation, although there was a group of beetles associated with decaying matter which would not be likely to be found *together* in natural litter. It seems unlikely that this interpretation could be greatly improved by further work, in view of the large size of the subsample already examined, but full recording of the assemblage is desirable if the dating is reasonably secure.

Trench 5, Context [5005], Sample 1/BS

Moist, dark grey-brown (mottled with dark grey, light yellow-brown and orange), crumbly (working unconsolidated), sandy silt with a possible ash component. Stones to 6 mm were present together with charcoal and ?ancient root traces.

The minute washover of a few cm^3 consisted of fine charcoal with some poorly preserved charred cereal grains, and the very small residue of about 400 cm^3 yielded further cereal grains together with some charcoal (to 40 mm in maximum dimension) and rounded fragments of brick/tile, with rather a lot of charred ?heather (cf. *Calluna vulgaris* (L.) Hull) root/twig fragments (to 20 mm) and a few small fragments of unidentified charred root or rhizome. The cereals were bread/club wheat (*Triticum aestivo-compactum*), with single grains of barley (*Hordeum* sp.) and oats (*Avena* sp.). In all there were perhaps no more than about 10 cereal grains from this large subsample.

15.4.2 Vertebrate remains

Vertebrate remains were recorded from all 12 contexts submitted for assessment. Preservation records were made for material from seven of these contexts.

Overall preservation was described as poor, except for Context [2016] which was recorded as good. Angularity (appearance of broken surfaces) was mostly noted as battered or rounded. Colour was recorded as variable, although it was generally consistent within contexts.

The degree of fragmentation of the bones was moderate, most fragments being between 5 and 20 cm in largest dimension. Dog gnawing and butchery were evident on 10 - 20 % of fragments from some contexts. Evidence of fresh breakage was observed on fragments in all contexts except [2016]. Burnt fragments were noted in Contexts [4009] and [5001].

A total of 61 fragments (weighing 1435 g) were recovered, of which 17 (weighing 767 g) were identifiable to species (Table 2). The species present were cattle (13 fragments), pig (1) and horse (3). A single bird fragment (not identifiable to species) was noted in Context [4003]. Two loose teeth (giving ageing information) and four measurable bones (all cattle) were noted and the measurements are given in Table 3.

A preponderance of teeth was noted, which can be attributed to taphonomic rather than depositional factors as teeth generally survive better in conditions of poor bone preservation.

15.5 Discussion and statement of potential

15.5.1 Sediment samples

The recovery of bioarchaeological remains is very rare from a site of this type in the northern part of the Vale of York, so the presence of moderate quantities of plant remains and appreciable numbers of invertebrate remains preserved by anoxic waterlogging is noteworthy. In this case the biological remains from Context [2025] were consistent with the archaeological interpretation of a ditch fill, but also indicated the potential for exploring aspects of human occupation in the vicinity.

15.5.2 Vertebrate remains

The small size of the assemblage and poor preservation of the fragments precludes any further analysis of the vertebrate remains. Therefore, the assemblage is of little interpretative or zooarchaeological value.

The poor state of vertebrate preservation suggests that if further excavation were to take place, a moderate-sized bone assemblage might be recovered but would probably be poorly preserved and hence of little use in site interpretation or zooarchaeological work. However, a basic archive should be made of any further vertebrate material recovered.

15.6 Recommendations

Given the location of the site in an area with almost no palaeoenvironmental evidence, further analysis of these samples, and investigation of any others from the excavations should be undertaken, providing the deposits can be dated sufficiently accurately. If further excavation is undertaken an extensive sampling programme should be implemented and provision made for the subsequent analysis and publication of the material.

No further work is recommended on the current vertebrate assemblage. If further excavation recovers a larger quantity of bone, which can be tightly dated, a basic archive should be produced.

15.7 Retention and disposal

These samples and any residues derived from them should be retained in the short term in case further work can be undertaken; in the longer term, they should be stored as part of the site archive if further work is carried out and the results prove to be of value.

The vertebrate remains need not be kept.

15.8 Archive

All material is currently stored in the Environmental Archaeology Unit, University of York, along with paper and electronic records pertaining to the work described here.

15.9 Acknowledgements

We are grateful to Nick Pearson of On-Site Archaeology for supplying the material and archaeological information and to English Heritage for allowing AH and HK to work on this material.

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Table 1. List of samples from Site 169, West Lilling, North Yorkshire.

Context	Sample	Action taken	Retention/disposal
2025	2/BS	8 kg sieved to 300 m and the washover sieved to 300 m. Paraffin flotation on the fraction of the residue <4mm.	Should be retained.
5005	1/BS	7 kg sieved to 300 m and the washover sieved to 300 m	Should be retained.

Table 2. Vertebrate remains from Site 169, West Lilling, North Yorkshire.

Taxa		No. measurable	No. teeth	Total no. fragments	Weight (g)
Horse	*Equus* f. domestic	-	-	3	206.5
Pig	*Sus* f. domestic	-	-	1	11.0
Cow	*Bos* f. domestic	4	2	13	549.8
Subtotal		4	2	17	767.3
Bird		-	-	1	1.0
Large mammal		-	-	37	654.4
Medium-sized mammal		-	-	2	7.7
Unidentified		-	-	4	4.7
Subtotal		-	-	44	667.8
Total		4	2	61	1435.1

Table 3. Measurements of vertebrate remains from Site 169, West Lilling, North Yorkshire.

Context	Date	Species	Element	Side	Measurements			
2002	?4th C AD	Cow	Metacarpal	l	Bp=51.22	Dp=29.86		
2016	?4th C AD	Cow	Tibia	l	Bd=65.39	Dd=48.17		
2016	?4th C AD	Cow	Calcaneum	r	GL=138.17	DS=42.69	C=29.80	C+D=52.35
4009	?4th C AD	Cow	Metatarsal	r	Bp=40.57	Dp=38.61		

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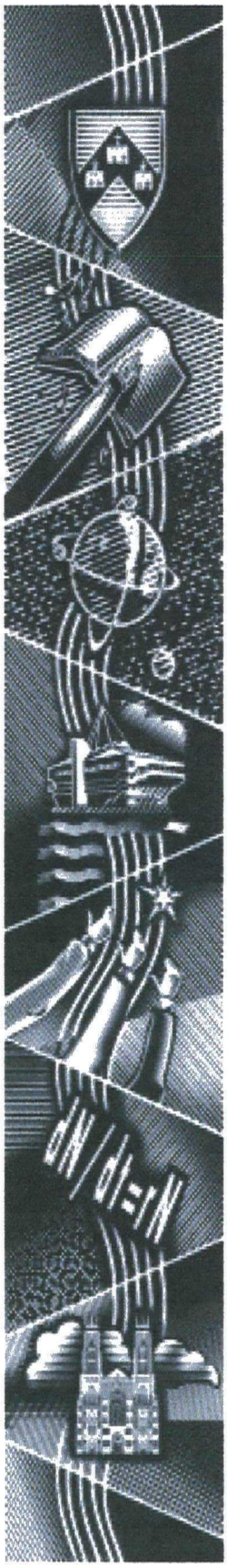

Evaluation of biological remains from excavations near West Lilling, North Yorkshire (site code: OSA99EX03)

by

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Report No **2000/82**

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15.11 Summary (excavation phase)

A series of sediment samples and one small box of hand-collected bone from deposits revealed by excavations near West Lilling, North Yorkshire, were submitted for an evaluation of their bioarchaeological potential.

Most of the sediment samples yielded no more than a very little charcoal and few modern seeds, though there were traces of other charred plant material which included wheat chaff and some debris perhaps from burnt turves or peat, all probably ancient. These samples probably do not warrant further study. In contrast, one deposit was quite rich in charred plant remains, including cereal grains and wheat chaff whilst two yielded well preserved plant and insect remains preserved by waterlogging. These all deserve further analysis.

A small assemblage of vertebrate remains was recovered. Most of the fragments were poorly preserved and few bones could be identified to species. No further work on the bone assemblage is warranted.

15.12 Introduction

An archaeological evaluation excavation was carried out by On-Site Archaeology near West Lilling, North Yorkshire (NGR: SE 640 644).

A series of sediment samples ('GBA'/'BS' sensu Dobney et al. 1992), and one small box (of approximately 10 litres) of hand-collected bone, were recovered from the deposits. The deposits were, where dated, Roman or medieval.

All of this material was submitted to the EAU for an evaluation of its bioarchaeological potential.

15.13 Methods

15.13.1 *Sediment samples*

The sediment samples were inspected in the laboratory. Thirteen of them were selected (by the excavator) for investigation and their lithologies were recorded, using a standard pro forma, prior to processing, following the procedures of Kenward et al. (1980; 1986), for recovery of plant and invertebrate macrofossils. Table 1 shows a list of the submitted samples and notes on their treatment. The flot, washovers and residues were examined for plant remains. The flot and washovers were also examined for invertebrate remains, and the residues were examined for other biological and artefactual remains.

15.13.2 *Vertebrate remains*

All of the bone was recorded in detail; subjective records were made of preservation, angularity (i.e. the nature of the broken surfaces) and colour, whilst quantities and identifications were noted where appropriate. Additionally, semi-quantitative information

was noted for each context concerning fragment size, dog gnawing, burning, butchery and fresh breaks. Fragments not identifiable to species (_B_ bones sensu Dobney et al. forthcoming) were grouped into three categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid), and completely unidentifiable.

15.14 Results

15.14.1 Sediment samples

The results are presented in context number order by period[8]. Archaeological information, provided by the excavator, is presented in square brackets.

Context 6091 [cut fill in 6089, Roman]
Sample 31/BS (4 kg sieved to 300 microns with washover)

Just moist, light to mid red-brown to mid to dark grey-brown. Stiff (working plastic) clay with some ?rotted charcoal and modern rootlets present.

The tiny residue consisted of sand, grit and ?iron pan; there was a small washover of about 25 cm^3 of modern rootlets and ancient charcoal (to 5 mm) with traces of charred cereal grains and chaff, including a few ?spelt wheat, Triticum cf. spelta, glume-bases in reasonably good condition, and hulled barley (Hordeum) grains, but all at very low concentrations.

Context 6150 [fill in 6151, Roman]
Sample 43/BS (5 kg sieved to 300 microns with washover)

Wet, light grey-brown to mid to dark grey-brown, soft (working soft and slightly sticky), slightly clay, slightly silty sand with some ?cinder present.

The moderately large residue of about 500 cm^3 comprised clean quartz sand with some ?iron pan. The washover of about 100 cm^3 was of charcoal (to 10 mm) with woody and herbaceous detritus. Amongst these fragments were abundant well preserved seeds of elder (Sambucus nigra L.) and stinging nettle (Urtica dioica L.) and modest numbers of seeds of the goosefoots in Chenopodium Section Pseudoblitum. Other identifiable plant remains included a rather large assemblage of taxa representing waterside vegetation and stands of weeds, the latter including communities of sandy fields and neglected waste places. There was also a small component perhaps from grazed or trampled turf. Some lumps (to 5 mm) of sandy humic silt observed might be from inwashed soil or more humus. Notable in the material were rather large numbers of fragments of vegetative material with characteristic darkened epidermis and strongly sinuous cell walls. Though not identified at this stage, it seems likely this material could be identified and might offer further interpretative information. One or two ?spelt glume-bases were also noted. A small group of insects was recovered, including aquatic and

[8] Periods based on preliminary phasing by excavators, and may be subject to review.

waterside forms, and some terrestrial species. There were also some cladoceran resting eggs. Preservation varied, but most insect remains appeared identifiable.

Context 6161 [fill in 6160, Roman]
Sample 20/BS (5 kg sieved to 300 microns with washover)

Just moist, light to mid grey-brown, unconsolidated, slightly silty sand.

The moderate-sized residue of about 400 cm^3 consisted of clean quartz sand and a little ?iron pan. The washover of about 120 cm^3 was at least half by volume sand and ?iron pan, the rest charcoal (to 10 mm) with some reasonably well preserved ?spelt glume-bases and a few charred remains which might have originated in burnt turves or peat.

Context 6182 [fill in 6185, Roman]
Sample 26/BS (5 kg sieved to 300 microns with washover)

Just moist, mid grey-brown, crumbly to unconsolidated, slightly silty sand.

The moderate-sized residue of about 500 cm^3 comprised clean quartz sand and a little ?iron pan. The 40 cm^3 washover was of sand and extremely strongly silt-coated charcoal with modern remains (rootlets, earthworm egg capsules and perhaps most of the few weed seeds). There were traces of insect remains, but insufficient for further analysis.

Context 6183 [fill in 6206, Roman]
Sample 27/BS (5 kg sieved to 300 microns with washover)

Moist, mid grey-brown, crumbly to unconsolidated, slightly silty sand.

The moderate-sized residue of about 500 cm^3 was of clean quartz sand with a little ?iron pan and traces of very decayed bone. The small washover of about 40 cm^3 contained more sand with some charcoal (to 20 mm) and very decayed bone with a very few charred cereal grains (oats, Avena, and wheat, Triticum). Again there were traces of charred remains which might have originated in turves.

Context 6184 [fill in 6206, Roman]
Sample 28/BS (5 kg sieved to 300 microns with washover)

Moist, mid grey-brown, crumbly to unconsolidated, slightly clay silty sand. Fragments of mammal bone were present in the sample.

The moderate-sized residue of about 500 cm^3 was of clean quartz sand with a single large (65 mm) cobble fragment and a trace of bone. The washover of about 40 cm^3 was of sand and charcoal (to 10 mm) with a few charred wheat grains, charred weed seeds (Bromus) and some very decayed bone; the few uncharred grass fruits present included modern and ?fossil material. Insect remains were restricted to a few well-decayed weevil fragments (reddened, with eroded edges).

Preservation of the 27 unidentified bone fragments recovered from this sample was very poor. The surface of the bones had been completely destroyed by chemical erosion and their fragility had resulted in much fresh breakage.

Context 6205 [fill in 6089, Roman]
Sample 41/BS (5 kg sieved to 300 microns with washover)

Moist, light yellow-orange-brown to mid to dark grey-brown, crumbly to unconsolidated, slightly clay slightly silty sand and ?ash with patches (to 10 mm) of light brown clay. Some ?cinder/clinker was present in the sample which had an overall burnt appearance.

The moderate-sized residue of about 350 cm^3 consisted of clean quartz sand with ?iron pan, pottery fragments (to 70 mm) and a little charcoal (to 10 mm). The washover comprised about 120 cm^3 of charcoal with some sand-sized undisaggregated silt), and traces of reasonably well preserved charred cereals (one or two of each of oats (Avena), barley and wheat, as well as a little ?spelt chaff). There were also traces of charred plant remains which might have originated in turves.

Context 6237 [fill in 6089, Roman]
Sample 39/BS (5 kg sieved to 300 microns with washover)

Just moist, light brown through black in shades of orange-grey-brown (colours rather jumbled), slightly clay slightly silty ashy sand with fragments of rotted charcoal. The sample had an overall burnt appearance.

The small residue of about 200 cm^3 was of clean quartz sand and ?iron pan. The large washover of 400 cm^3 comprised about 100 cm^3 clean quartz sand, the rest being angular charcoal (to 25 mm), probably mostly oak (Quercus). There were modest amounts of charred cereal remains, including ?spelt glume-bases and some other chaff which was probably also spelt wheat. The grains observed were often very puffed or eroded, and there was some iron salt deposition on both grains and charcoal. Other cereals noted were oats and ?rye (cf. Secale cereale L.).

Context 6289 [fill in 6290, Roman]
Sample 49/T (5 kg sieved to 300 microns with paraffin flotation)

Moist, mid to dark grey to light to mid grey-brown, crumbly to unconsolidated (working soft), sandy slightly clay silt with a little fine and coarse herbaceous detritus.

The small to moderate-sized residue of about 500 cm^3 yielded about 300 cm^3 clean quartz sand, the rest being rather decayed wood debris (to 35 mm), including twigs, probably of elder, and at least one fragment which appeared to have been worked. The presence of some charred ?heather (Calluna vulgaris (L.) Hull) root/basal twig material and some ?pteridophyte roots perhaps indicates the presence of remains from turves or peat (some ?burnt peat fragments were also noted), as may some of the grassland taxa represented by uncharred seeds. Other seeds indicate disturbed habitats, though with more evidence for grassland than

for arable land, for example. The abundance of well preserved seeds makes this deposit a very suitable source for useful bioarchaeological information if studied more closely.

The flot yielded quite large numbers of insect remains, together with some mites and abundant water flea resting eggs (ephippia of Cladocera). The last included at least three distinct types. Aquatic beetles were numerous, too, a small Helophorus sp. being the most abundant taxon, but accompanied by a range of others including Ochthebius ?minimus (Fabricius), Hydrobius fuscipes (Linnaeus), a second Helophorus, two species of Hydrophilinae, a hydroporine, Colymbetes fuscus (Linnaeus), and a haliplid. Aquatic deposition is therefore certain, but the abundant cladoceran resting eggs may indicate temporary water, probably much reduced in the summer. The water margins were sufficiently undisturbed to support a little aquatic-marginal vegetation on which plant-feeders lived, and to allow some mud-dwellers to survive.

The terrestrial component included a range of plant feeders and ground beetles able to live on or under fairly sparse vegetation, which included nettles, Urtica spp., on the basis of Brachypterus sp. and Cidnorhinus quadrimaculatus (Linnaeus). There were distinct hints of grassland. More significant among the terrestrial species was a distinct synanthropic component. Taxa recorded in this category included Typhaea stercorea (Linnaeus), of which there were at least two, Gyrohypnus angustatus Stephens, Cordalia obscura (Gravenhorst), Ephistemus globulus (Paykull), and Cryptophagus spp., collectively perhaps indicative of moist but open-textured rotting plant matter. The litter on a moist surface, perhaps in a stable or animal pen, might support a community of this kind. A single Anobium ?punctatum (Degeer) probably originated in a structure, but the woodworm is common enough in the wild. Dung beetles were present in moderate numbers, four species of Aphodius (one fairly common) and a Geotrupes sp. being noted. A few other taxa may also have exploited dung, such as three or more species of Cercyon, Cryptopleurum minutum (Fabricus), Platystethus arenarius (Fourcroy) and Oxyomus sylvestris (Scopoli).

Most of the invertebrates were excellently preserved, but a few of the terrestrial forms appeared more decayed, perhaps having entered indirectly as corpses via soil or other material: in view of the botanical evidence, turves might be a source.

Careful analysis of the insects from this subsample, preferably combined with those from another 5 kg, would provide a detailed picture of conditions in the cut, and should allow substantially more to be deduced concerning conditions and activities on the adjacent surfaces.

Context 6310 [fill, Roman]
Sample 53/BS (5 kg sieved to 300 microns with washover)

Just moist, mid grey-brown, crumbly to unconsolidated, slightly silty sand.

The moderate-sized residue of about 500 cm^3 consisted of clean quartz sand with some fragments of flaggy micaceous sandstone and rounded clasts of ?burnt soil and ?iron pan.

The small washover of about 40 cm^3 was of sand and charcoal (to 20 mm) with traces of charred cereals (oats, barley, ?wheat) and modern (germinating!) weeds.

Context 6311 [fill, Roman]
Sample 54/BS (5 kg sieved to 300 microns with washover)

Moist, mid grey-brown (mottled lighter and darker in patches), crumbly to unconsolidated, slightly clay silty sand with some stones (2 to 6 mm) present.

The moderate-sized residue of about 325 cm^3 consisted of clean quartz sand with a little very decayed bone and ?iron pan. The washover of about 70 cm^3 was of bone fragments and sand with some very decayed elder seeds and beetles (a few tough weevils of the kind often found in deposits where most insects have decayed completely) and a trace of charred ?heather root/twig perhaps from turves.

Forty-five fragments of bone, all >30 mm in size, were recovered. As with the hand-collected material from this deposit, preservation was poor and fragments were battered and eroded in appearance.

Context 6100 [layer, ?medieval]
Sample 9/BS (5 kg sieved to 300 microns with washover)

Wet, light to mid brown to mid to dark grey-brown, soft and slightly sticky (working somewhat thixatropic), clay silty sand with patches (to 5 mm) of very dark brown ?humic material and medium-sized stones (20 to 60 mm).

The very small residue of about 100 cm^3 comprised very clean quartz sand. There was a washover of about another 40 cm^3, mainly of tiny pellets of undisaggregated silt, with traces of charcoal (to 5 mm) and a little more sand as well as a few seeds, most of which were probably modern.

Many very small and extremely poorly preserved fragments of unidentifiable bone were recovered from this sample.

Context 6134 [fill, unphased]
Sample 52/BS (1 kg sieved to 300 microns with washover)

Just moist, light to mid grey-brown (with lighter mm-scale mottling), crumbly to unconsolidated, sandy (and ?ashy) silt with fragments of burnt mammal bone present.

The small residue of about 75 cm^3 consisted of burnt bone (to 15 mm), charcoal (to 20 mm), sand, and gravel; the washover of about 50 cm^3 contained further sand with some charred organic debris amongst which there was more burnt bone, charcoal and perhaps debris from the burning of turves (charred herbaceous detritus and charred moss stems-though the remains were extremely sparse).

This sample yielded over 100 small, very brittle and fragmented bones, all of which were burnt. Although only a single fragment was identifiable to species (a single sheep astragalus), most of the material represented medium-sized mammals (assumed to be caprovid, pig or small cervid).

15.14.2 Hand-collected vertebrate remains

The hand-collected vertebrate remains were recovered from 14 contexts, ten of which dated to the Roman period. The remaining deposits were of modern origin or undated. Of the 141 fragments recovered, 100 were from the Roman deposits. Preservation was, on the whole, so poor that few fragments could be identified to species. Eroded bone surfaces, the result of the acidic nature of the deposits, were common. Much fresh breakage was noted throughout the assemblage, probably because of the brittle and fragile nature of the bones. Half the assemblages from contexts [6075], [6090], [6092], [6095] and [6125] (of Roman date) contained burnt or heavily calcined fragments, which again were somewhat delicate. The few bones which were identified to species represented the remains of the major domestic species, cattle, caprovid and pig.

Summary information for the hand-collected vertebrate assemblage is presented in Table 2.

15.15 Discussion and statement of potential

With one or two exceptions, survival of plant remains other than charcoal in these deposits was, as might be expected, poor, though many yielded a few chaff fragments (which mostly seemed to be of spelt wheat), and a few charred cereal grains, and there were sometimes hints that material derived from burnt turves was present. Two samples gave large assemblages of well preserved remains, one (Sample 43, Context [6150]) primarily indicating disturbed habitats in the vicinity of a waterhole or ditch, the other (Sample 49, Context [6289]) having evidence which might point to grazing land in the vicinity or even to the deposition of animal dung or stable manure.

Overall, the hand-collected vertebrate assemblage was very fragmented, with few identifiable bones and none which could provide biometrical or age-at-death data. The very poor preservation is most likely to be a reflection of the acidic nature of the sediments and, consequently, these deposits show no potential for the preservation of an interpretatively useful assemblage of vertebrate remains.

15.16 Recommendations

Given the rarity of deposits with good preservation of charred and uncharred remains from rural sites of this date in the Vale of York, every effort should be made to study further at least some material from this site. Charred cereal remains should certainly be recorded in more detail from Context [6237] and any other contexts which are thought to contain more than small amounts of charred material. Plant and invertebrate remains from Context [6289] should be studied in detail and those from Context [6150] are also worthy of additional investigation. It would probably be worthwhile making a further selection of material on the

basis of sieving 5 kg subsamples of as many well-dated deposits from primary contexts as possible and judging by eye from the volume of washover yielded.

No further analysis of the vertebrate material is warranted.

15.17 Retention and disposal

All of the current material should be retained for the present.

15.18 Archive

All material is currently stored in the Environmental Archaeology Unit, University of York, along with paper and electronic records pertaining to the work described here.

15.19 Acknowledgements

The authors are grateful to Guy Hopkinson of On-Site Archaeology for providing the material and the archaeological information, and to English Heritage for allowing AH and HK to contribute to this report.

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Table 1. List of examined sediment samples from excavations near West Lilling, North Yorkshire, with notes on their treatment.

Context	Sample	Notes
6091	31	4 kg sieved to 300 microns with washover
6100	9	5 kg sieved to 300 microns with washover
6134	52	1 kg sieved to 300 microns with washover
6150	43	5 kg sieved to 300 microns with washover
6161	20	5 kg sieved to 300 microns with washover
6182	26	5 kg sieved to 300 microns with washover
6183	27	5 kg sieved to 300 microns with washover
6184	28	5 kg sieved to 300 microns with washover
6205	41	5 kg sieved to 300 microns with washover

6237	39	5 kg sieved to 300 microns with washover
6289	49	5 kg sieved to 300 microns with paraffin flotation
6310	53	5 kg sieved to 300 microns with washover
6311	54	5 kg sieved to 300 microns with washover

Table 2. Summary of the hand-collected vertebrate remains from a site near West Lilling, North Yorkshire.

Date	Context	No. of fragments	Preservation	Notes	Weight (g)
modern	6000	1	Fair; battered in appearance.	Unidentified: 1 large mammal sized shaft fragment.	9
Roman	6075	16	Fair; rather brittle.	Unidentified: 5 tooth enamel fragments, 11 unidentified fragments (all burnt)	15
Roman	6090	5	Fair; fragile.	Unidentified: 5 fragments (burnt).	5.2
Roman	6092	2	Fair; fragile.	Unidentified: 2 fragments (burnt).	1
Roman	6095	29	Fair; battered and rounded; fawn in colour. Some surfaces eroded.	Cattle: 1 P3, 1 first phalanx fragment. Unidentified: 27 mainly large sized mammal fragments	54
modern	6097	29	Variable preservation.	Cattle: 1 metapodial, 1 carpal and 1 maxillary molar. Caprovid: metapodial. Pig: canine fragment. Unidentified: 24 mainly large sized mammal fragments.	45.2
Roman	6125	9	Fair; brittle.	Caprovid: distal radius (burnt). Unidentified: 8 medium-sized mammal fragments (all burnt).	8.2
no info	6132	1	Fair; battered	Cattle: 1 mandibular molar (M1/M2).	15
Roman	6142	11	Fair to poor; root etching and some damage to bone surface.	Cattle: 1 ulna. Caprovid: 1 maxillary molar (M3). Pig: 1 maxilla with teeth *in situ*. Unidentified: 8 mainly large sized mammal fragments, including shaft and rib.	84
Roman	6170	15	Very poor preservation; eroded and battered.	Unidentified: 10 tooth enamel fragments and 5 unidentified fragments.	14.2
Roman	6258	10	Poor.	Unidentified: 10 tooth enamel fragments.	5.5
Roman	6307	4	Variable, fair and poor.	Caprovid: 1 astragalus, 1 calcaneum. Unidentified: medium-sized mammal shaft fragments.	11.5
Roman	6310	1	Very poor; fragile.	Cattle: 1 maxillary molar.	7
No info	6311	10	Poor; battered.	Cattle: 1 second phalanx fragment. Caprovid: 1 metatarsal, 1 humerus, 1 mandible (no teeth). Unidentified: 6 large mammal sized fragment.	37

16.0 Appendix 7 ~ Excavation Project Design

Guy Hopkinson

1.0 Site Location, Geology & Topography

1.1 The site lies close to the village of West Lilling in the County of North Yorkshire. It is located to the north of Lilling Low Lane, at National Grid Reference SE 640 644.

1.2 The evaluation site was located on a discrete area of sand and gravel surrounded by warp and lacustrine clay, which overlies Bunter and Keuper Sandstone.

1.3 The site is situated at the foot of the Howardian Hills, which rise to the north, and some 200 metres from the River Foss, to the south and west. The area is currently arable land.

2.0 Archaeological Description & Summary of Previous Work

2.1 The site lies in an area of known archaeological significance. An RCHME sketch plot of the area indicates the presence of a rectilinear enclosure spanning the junction of Lilling Low Lane and the minor road between Sheriff Hutton and Strensall (NGR SE 6345 6480). The same plot also records a Roman road running north - south, to the south of the current investigation (approx. NGR SE 6375 6415). Further to the south is Lilling Green Romano-British farmstead with associated fields and trackways (Swan, Jones & Grady: 1993).

2.2 Aerial photographs of the area studied as part of the BP pipeline project have also revealed a number of cropmarks in the immediate vicinity.

2.3 A fluxgate gradiometer survey of the area has been undertaken as part of the BP pipeline works. This encompassed an area measuring 260 metres by 40 metres, and revealed a number of anomalies, mainly concentrated at the western end of the survey area, which included ditch and pit type anomalies.

2.4 An evaluation of the site was undertaken during January and February of 1999. This provided evidence of a medieval rigg and furrow cultivation system, which overlay a number of Roman/Romano-British features, which were interpreted as a 'villa' and associated field system. The results from each of the five trenches excavated during the evaluation program are summarised below.

2.4a Trench 1 revealed only a single furrow.

2.4b The earliest features in Trench 2 consisted of a series of ditches. At the northwest end of the trench was a north - south aligned ditch. Towards the centre of the trench was a second ditch, aligned approximately east - west, and thought to be related. The fills of these ditches were waterlogged and contained organic material. The ditches were sealed by a 0.30m thick deposit containing Romano-British pottery. An intersection between two further ditches, aligned northeast - southwest and east - west, was also apparent further along the trench. A 0.5m wide slot through the intersection revealed

a waterlogged fill similar to the other two ditches. Part of a cobble spread, possibly a surface, truncated by a furrow was situated at the northwestern end of the trench.

2.4c Two east - west aligned ditches were found in Trench 3, one situated at the southeastern end and the other towards the northwestern end of the trench. Located between them was a third ditch aligned approximately north - south. A cobble spread, truncated by a furrow, was situated at the southeastern end of the trench.

2.4d Two ditches, one aligned approximately north - south and the other east - west, were located in Trench 4. The ditches were thought to be related. Romano-British pottery was recovered from the fill of the east - west ditch. A row of three postholes, aligned east - west, were situated at the southeastern end of the trench and may be associated with the ditches. The ditches and one of the postholes were sealed by the remains of a relic soil horizon containing Romano-British pottery and a small dump of painted plaster fragments. Towards the centre of the trench was a stone structure set within a cut. This was only partially revealed during the evaluation, and little can therefore be suggested as to its origin or function. Cut into the relic soil horizon were two wall foundations aligned approximately northeast - southwest. The foundations bounded a cobble surface packed with clay which incorporated an earlier east - west aligned wall foundation. A pit containing a quantity of charcoal and burnt clay was sealed by the earlier wall foundation. The foundations were overlain by a spread of demolition debris containing lumps of *opus signinum* and tile.

2.4e The trench contained two ditches, one aligned north - south and the other northeast - southwest, and a ditch terminal. A cobble spread partially overlay the north - south ditch. A curvilinear slot and a ?narrow gully were situated at the southeast end of the trench.

2.5 Subsequent to the results of the evaluation the geophysical survey was extended to the northwest in a 40 metre wide corridor along the pipeline route, and also to the northeast and southwest of the original survey area. The northwest extension measured 40m by 200m, the northeast extension 120m by 120m, and the southwest extension 120m by 40m This showed '*... a continuation of* [the excavated] *features and would appear to have mapped the core of the settlement. A number of linear trends orientated north - south through the data indicate the remains of ridge and furrow cultivation...* [and] *a broad linear anomaly that is likely to be natural in origin*' (Harvey, L, 1999).

3.0 The Excavation Programme

3.1 An archaeological evaluation of the proposed development area was undertaken by *On-Site Archaeology* during January and February of 1999, the results of which are reported on in OSA report NO: 99EV02 and have been summarised in this document (paragraphs 2.4a - 2.4e).

3.2 It is clear from the evaluation trenches that substantial archaeological deposits are likely to exist within the proposed pipeline route. Section 5 below sets out a detailed methodology for the excavation of these remains.

4.0 Research Objectives

4.1 The evaluation of this site provided significant information regarding the medieval and Romano-British activity in this area. Following assessment of the environmental samples, the Environmental Archaeology Unit at the University of York (EAU) stated that *'the recovery of bioarchaeological remains is very rare from a site of this type in the northern part of the Vale of York'* and that *'if further excavation is undertaken an extensive sampling programme should be implemented and provision made for the subsequent analysis and publication of the material'*. The excavation of the site allows an opportunity to expand on the information gained from the evaluation, and to address the following questions:

4.1a what was the character and extent of pre-Roman occupation of this area?

4.1b what was the character and extent of Romano-British occupation of this area?

4.1c what was the character and extent of post-Roman, pre-medieval activity?

4.1d what was the character and extent of the medieval exploitation of the site?

4.1e what is the nature, degree and value of environmental preservation on the site?

5.0 Excavation Methodology

5.1 The on-site examination will consist of the following work:

5.1a The excavation area will comprise a two metre wide corridor based along the pipe centre line, which will be surveyed by the pipe contractors (Murphys). This will extend immediately from the east of Howl Beck to a point approximately 30m to the east of evaluation Trench 2 (or where archaeological features are no longer apparent). This area will incorporate evaluation Trenches 5 and 2, which were positioned on the pipe centre line[9]. See Figure 1 at back of this document.

5.1b Prior to the topsoil strip a metal detector survey of the excavation area shall be conducted, as will the machine removed topsoil/overburden. All metal detected finds shall be recovered according to the Code of Practice laid down by the 1996 Treasure Act.

5.1c Within the area under consideration deposits will initially be removed by JCB under archaeological supervision down to the first archaeological horizon. The evaluation exercise indicated that archaeological deposits may be present 0.30m beneath the current ground surface. Archaeological deposits or features present will be hand cleaned to determine their exact nature and extent. Thereafter excavation will be entirely by hand unless it can be shown that the material present does not require detailed examination.

[9] During the pipe laying process the construction spread through this area would then involve no further soil stripping, except where it can be shown that further archaeological deposits are not likely to exist under the running track. A temporary running track, using 'bog mats' placed directly onto the topsoil would be used for the passage of construction traffic through this archaeological area.

5.1d All features will be excavated to their full extent within the 2 metre wide excavation area. Pits and postholes will be half sectioned, their sections recorded, and then the remainder of the fill excavated.

5.2 Archaeological recording will comprise:

5.2a The trench location and section profiles will be recorded;

5.2b Archaeological deposits will be recorded (surveyed, drawn, described and photographed) following standard On-Site Archaeology procedures;

5.2c all records will be indexed, ordered, quantified, and checked for consistency;

5.2d all artefacts and ecofacts recovered and retained from the excavation will be packed and stored in the appropriate materials and conditions to ensure that minimal deterioration takes place and that all their associated records are complete;

5.2e all archaeological contexts will be sampled in accordance with a sampling strategy which will be agreed in advance with the EAU, University of York. In addition to hand collected animal bone from all contexts, contexts selected in consultation with the EAU will be sieved to retrieve more meaningful collections of faunal remains;

5.3 The details and processes outlined in 5.1 - 5.2 will produce the following output as an archive report:

5.3a plan of site showing the position of trench;

5.3b portfolio of drawn sections, trench plans, and, where appropriate, drawings of artefacts;

5.3c an interpretation of the structural sequence;

5.3d an interpretation of the archaeological and research potential of the remainder of the site.

5.3e In addition the report will contain the following elements:

- non-technical summary
- introductory statements
- aims and objectives
- method statement
- objective summary of results
- interpretation and conclusions
- supporting illustrations and interpretative drawings
- supporting data
- references

5.3f The archive will be curated following the guidance provided in the 'Standards in Museum Care of Archaeological Collections', Museums and Galleries Commission, 1992.

The site archive (paper, drawn, photo, digital and material) will be checked and cross-referenced before completion of the field work The archive will include:

- survey reports
- site notebook / diaries
- original photographic records
- site drawings
- original context records
- artefacts cleaned where appropriate and packed
- ecofacts and other sample residues
- original finds records
- original sample records
- original skeleton records
- original specialist reports
- index or database and printout
- a summary of the nature / quality of the various classes of data collected.

5.4 Allowance will be made for the preparation and publication of a synopsis of the narrative report, material archive and research potential of the site in a form such as is used in *The Yorkshire Archaeological Journal.*

5.5 *On-Site Archaeology* will demonstrate by providing CV 's that the staff appointed to direct, supervise, and work on this project have relevant experience of working both on complex sites and the complex archives which they produce.

5.6 The results of the project will be published in an appropriate archaeological journal or monograph. The suitable level of publication will be dependent on the significance of the project results, but as a minimum the basic requirements of Appendix 7.1 of *Management of Archaeological Projects* (English Heritage 1991) will be met.

5.6a The publication report will contain the following information:

- the research objectives as expressed in the project design;
- circumstances and organisation of the work and the date at which it was undertaken;
- identity of the individual/organisation by whom the work was undertaken;
- summary account of the results of the project;
- summary of the contents of the project archive, where it is housed and how it may be consulted.

5.6b The report on the fieldwork will additionally give:

- the national grid reference

- the parish

5.6c Report-writing criteria

When writing up the results of this project, consideration will be given to the following:

- the report will appropriately reflect the importance of the results of the project and deal adequately with the site 's social, political, and historical context;
- the interpretation of the site will be justified by the evidence presented. Ambiguities in the data base will be discussed, and where more than one interpretation is possible the alternatives will be presented;
- the report will present information about what was found in a well balanced logical. accessible and structured way. It will be immediately intelligible to and usable by those who know nothing about the site;
- the extent to which the objectives of the project have been fulfilled will be discussed, including a critical assessment of the methodologies employed;
- the report will be written clearly and concisely, and will make appropriate, consistent. and economical use of other methods of data presentation, e.g. tables, plans, or photographs;
- specialist reports and their supporting data will be carefully chosen and given their proper value. Specialist contributors will be involved in or informed of editorial decisions affecting the presentation of their work in print;
- all the constituent parts (text, figures, photos, and specialist reports) will cross-refer adequately. Readers will be able to find their way around the report without difficulty;
- attention will be drawn to areas of future study potential which it has not been possible to explore fully within the limits of the agreed project design.

5.6d Production criteria

Consideration will be given in producing figures and typescript to any notes for authors supplied by the appropriate publishing body. As part of the process of producing the report draft consideration will be given to the following:

- word-processing will be competently done and output checked by the contributor responsible for the original work;
- good quality clear prints of half tones and colour negatives for colour plates will be selected at an early stage in the preparation of the report draft and will be available to the editor with the rest of the report draft;
- the presentation of line drawings and tables will be discussed and agreed at an early stage in report preparation, and the art work will be available to the editor at the same time as the report draft;
- figure, table, and photograph captions will be drafted at an early stage;

- the bibliography will be complete, checked, integrate all contributors' bibliographic contributions, observe BSI, and use conventions compatible with the house style of the publishing body;
- errors are the responsibility of the authors and will so far as possible be identified and rectified before the editorial processes begin;
- text supplied to the editors will incorporate all revision necessary as a consequence of internal and external refereeing. It will be established with the publishing body at an early stage in the production processes what their refereeing requirements are. If these differ from those of the sponsors, any incompatibility will be resolved at an early stage;
- the format and presentation of the material will be agreed with the editors at an early stage;
- in-house editing by the project team will only be done after consultation with the publishing body and will take due consideration of the style and format of the published report;
- indexing will be carried out by a professional trained in that field.

5.7 *On-Site Archaeology* will backfill the trench with excavated material. Prior to doing so a non-degradable marker tape shall be laid along the length of the trench in order to facilitate the re-excavation of the same alignment when the pipe trench is cut.

6.0 Personnel

All work will be under the overall supervision of Mr. N Pearson MIFA (Member of the Institute of Field Archaeologists). Other project staff will/may include:

Project Officer	Guy Hopkinson
Excavation Team	Susan Diamond Anthony Dickson Chris Fenton-Thomas Marie-Claire Ferguson Guy Hopkinson
Finds Assistant	Faye Palmer
Palaeo-environmental advisor	Environmental Archaeology Unit, York University
Finds Analysis	Dr Alan Vince Barbara Precious Jane Cowgill Sandra Garside-Neville
Conservation	Sonia O'Connor, Bradford University Conservation Services, Lincolnshire County Council

7.0 Bibliography

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Ovenden-Wilson, S. 1998. *Teesside to Saltend Ethylene Pipeline. BP Site 169.* GSB Prospection Report No. 98/125.

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Project Design, Appendix A ~ Area Excavation

Fieldwork

1.1 Prior to any area excavation, appropriate survey (e.g. geophysical, earthwork, contour) or sampling strategy (e.g. for topsoil artefact densities, metal detecting, phosphate analysis) will be undertaken before the site strip. All metal detected finds shall be recovered according to the Code of Practice laid down by the 1996 Treasure Act.

1.2 The site will be mechanically stripped of topsoil and other overburden. An appropriate machine will always be used. This will normally be a JCB 3CX Sitemaster (or similar) fitted with a 1.80 metre wide toothless bucket. In other cases a, or for work with restricted access or working room a mini-excavator such as a Kubota KH 90 will be used. No plant will be allowed to cross stripped areas.

1.3 All machining will be undertaken under the direct control of experienced archaeologists.

1.4 All undifferentiated topsoil or overburden will be removed down to the first significant archaeological horizon in level spits.

1.5 Depending on the aims of the project, the excavated spoil may be monitored in order to recover artefacts. Where their findspots are plotted this will usually be on a 2m grid.

1.6 The surface exposed by the stripping will be cleaned using appropriate hand tools.

1.7 Should the site grid not have already been established it will be done at the cleaning stage. The grid will normally be based on a 10m spacing and related to the National Grid. A temporary benchmark related to Ordnance Datum will be founded.

1.8 After the cleaning and planning of the excavation area the excavation strategy will be finalised. This will take into account the project aims (which may need modifying at this stage) and the type, quality and quantity of remains revealed. The strategy will normally seek to maintain at least the following levels:

- all structures and all zones of specialised activity (e.g. funerary, ceremonial, industrial, agricultural processing) will be fully excavated and all relationships recorded
- ditches and gullies will be fully excavated and have all relationships defined, investigated and recorded.
- sufficient artefact assemblages will be recovered (where possible) to assist in dating the stratigraphic sequence and for obtaining ample ceramic groups for comparison with other sites.
- all pits, post and stake holes will be half-sectioned, drawn and then fully excavated.

- all layers will have their limits defined and will be drawn and recorded according to the principles of single context recording. Thereafter they will be fully excavated.

1.9 A palaeoenvironmental research strategy has been designed in advance of the project by the Environmental Archaeology Unit at the University of York (see appendix 6 below). This strategy may be varied depending on the results of the excavation and the nature of the exposed deposits. For carbonised remains, bulk samples of a minimum of 10 litres (but up to 30 litres for early prehistoric features) will be collected. Bulk samples of 10-30 litres will be taken from waterlogged deposits for analysis of macroscopic plant remains. Columns for pollen analysis will be taken where appropriate. Mollusc samples will be gathered when required. Other bulk samples for small animal bones and other small artefacts may be taken from appropriate deposits depending on the aims of the project.

1.10 Any finds of human remains will be covered and protected from public view during the excavation process. The coroner's office will be informed. Excavation, recording and removal will only take place under the relevant Home Office licence and local authority environmental health regulations.

1.11 All finds of gold and silver will be moved to a safe place and reported to the coroner's office according to the procedures relating to Treasure Trove. Where removal cannot be effected on the same working day as the discovery, suitable security measures will be taken to protect the artefacts from theft or damage.

Recording

1.12 All on-site recording will be undertaken in accordance with the standards and requirements of the *Archaeological Site Manual* (Museum of London 1994).

1.13 A continuous unique numbering system will be employed.

1.14 Written descriptions, comprising both factual data and interpretative elements will be recorded on standardised sheets.

1.15 Where stratified deposits are encountered a 'Harris'-type matrix will be compiled during the course of the excavation.

1.16 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.

1.17 Plans will normally be drawn at a scale of 1:20 will be used. Burials will be drawn at 1:10. Other detailed plans will be drawn at an appropriate scale.

1.18 Long sections of trench edges or internal baulks showing layers and any cut features will be drawn at 1:10 or 1:20 depending on amount of detail contained. Sections of features will be drawn at 1:10.

1.19 All sections will be accurately related to Ordnance Datum.

1.20 Registers of sections and plans will be kept.

1.21 A full black and white, and colour (35mm transparency) photographic record will be maintained. This will illustrate the principal features and finds both in detail and in a general context. The photographic record will also include working shots to represent more generally the nature of the fieldwork.

1.22 A register of all photographs taken will be kept on standardised forms.

Finds

1.23 All identified finds and artefacts will be collected and retained. Certain classes of material i.e. post-medieval pottery and building material may on occasion be discarded after recording if a representative sample is kept. No finds will be discarded without the prior approval of the archaeological representative of the local authority and the receiving museum.

1.24 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum. Finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in United Kingdom Institute for Conservation's *Conservation Guidelines No. 2.*

1.25 At the beginning of the project (prior to commencement of fieldwork) the landowner and the relevant museum will be contacted regarding the preparation, ownership and deposition of the archive and finds.

Project Design, Appendix B ~ Archiving, Post-Excavation & Publication

2.1 Following completion of each stage or the full extent of the fieldwork (as appropriate) the site archive will be prepared in the format agreed with the receiving institution. The excavation archive will be security copied and a copy deposited with the NAR before post-excavation analysis begins or as soon after as can be arranged.

2.2 On completion of the archive a summary report will be prepared. This will include:

- an illustrated summary of the results to-date indicating to what extent the project aims were fulfilled.
- a summary of the quantities and potential for analysis of the information recovered for each category of site, artefacts, dating and palaeoenvironmental data.
- proposals for analysis and publication

2.3 The proposals for analysis and publication will include:

- a list of the revised project aims arising from the fieldwork and post-excavation assessment.
- a method statement, which will make clear how the methods advocated are those best suited to ensuring that the data-collection will fulfil the stated aims of the project.
- a list of all tasks involved in meeting the stated methods to achieve the aims and produce a report and research archive in the stated format.
- details of the research team and their projected work programmes in relation to the tasks. Allowance will be made for general project-related tasks such as project meetings, management, editorial and revision time.
- a publication synopsis indicating publisher, report format and content shown by chapters, section and subheadings with the anticipated length of text sections and proposed number of illustrations.

2.4 The summary report embracing the analysis and publication proposals will be submitted to the local authority 's archaeological representative for approval.

2.5 Any significant variation in the project design, including timetables, proposed after the agreement of the proposals must be acceptable to the local authority 's archaeological representative.

2.6 The results of the project will be published in an appropriate archaeological journal or monograph. The suitable level of publication will be dependent on the significance of the project results, but as a minimum the basic requirements of Appendix 7.1 of Management of Archaeological Projects (English Heritage 1991) will be met.

Project Design, Appendix C ~ General

3.1 The requirements of the Brief will be met in full where reasonably practicable (see also para 3.3).

3.2 Any significant variations to the proposed methodology will be discussed and agreed with the commissioning agent 's archaeological representative in advance of implementation.

3.3 The scope of fieldwork detailed in the main part of the Written Scheme of Investigation is aimed at meeting the aims of the project in a cost-effective manner. *On-Site Archaeology* attempts to foresee all possible site-specific problems and make allowances for these. However there may on occasions be unusual circumstances, which have not been included in the programme and costing. These can include:

- unavoidable delays due to extreme bad weather, vandalism etc.
- trenches requiring shoring or stepping, ground contamination, unknown services, poor ground conditions.
- extensions to specified trenches or feature excavation sample sizes requested by the local authority 's archaeological advisor.
- complex structures or objects, including those in waterlogged conditions, requiring specialist removal.

Health and Safety

3.4 All relevant health and safety legislation, regulations and codes of practice will be respected.

3.5 With the introduction of the Construction (Design and Management Regulations) 1994 *On-Site Archaeology* works with Clients, Main Contractors, and Planning Supervisors to create a Health and Safety Plan. Each project will have its own unique plan.

Insurances

3.6 *On-Site Archaeology* holds Employers Liability Insurance and Public Liability Insurance.

3.7 *On-Site Archaeology* will not be liable to indemnify the client against any compensation or damages for or with respect to:

- damage to crops being on the Area or Areas of Work (save in so far as possession has not been given to the Archaeological Contractor)
- the use or occupation of land (which has been provided by the Client) by the Project or for the purposes of completing the Project (including consequent loss of crops) or interference whether temporary or permanent with any right of way

light air or other easement or quasi easement which are the unavoidable result of the Project in accordance with the Agreement

- any other damage which is the unavoidable result of the Project in accordance with the Agreement
- injuries or damage to persons or property resulting from any act or neglect or breach of statutory duty done or committed by the client or his agents servants or their contractors (not being employed by *On-Site Archaeology*) or for or in respect of any claims demands proceedings damages costs charges and expenses in respect thereof or in relation thereto

Copyright and Confidentiality

3.8 *On-Site Archaeology* will retain full copyright of any commissioned reports, tender documents or other project documents under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it will provide an exclusive licence to the client in all matters directly relating to the project.

3.9 *On-Site Archaeology* will assign copyright to the client upon written request but retains the right to be identified as the author of all project documentation and reports as defined in the Copyright, Designs and Patents Act 1988.

3.10 *On-Site Archaeology* will advise the Client of any such materials supplied in the course of projects, which are not *On-Site Archaeology*'s copyright.

3.11 *On-Site Archaeology* undertakes to respect all requirements for confidentiality about the Client's proposals provided that these are clearly stated. In addition *On-Site Archaeology* further undertakes to keep confidential any conclusions about the likely implications of such proposals for the historic environment. It is expected that Clients respect *On-Site Archaeology*'s and the Institute of Field Archaeologists' general ethical obligations not to suppress significant archaeological data for an unreasonable period.

Standards

3.12 *On-Site Archaeology* conforms to the standards of professional conduct outlined in the Institute of Field Archaeologists' Code of Conduct, the IFA Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, the IFA Standards and Guidance for Desk Based Assessments, Field Evaluations etc., and the British Archaeologists and Developers Liaison Group Code of Practice.

3.13 Project Directors normally will be recognised in an appropriate Area of Competence by the Institute of Field Archaeologists.

3.14 Where practicable *On-Site Archaeology* will liase with local archaeological bodies (both professional and amateur) in order that information about particular sites is disseminated both ways (subject to client confidentiality).